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Jason D. Oxman
Vice President and Assistant General Counsel

20 November 2002

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Triennial* ***Review.*** WCB Docket No. 01-338

Dear Ms. Dortch:

Covad Communications Company (Covad), by its attorneys, hereby respectfully submits this *ex parte* letter and attached declaration in response to rhetorical claims made by certain incumbent telephone companies that the FCC's linesharing rules have not benefited consumers. In stark contrast lo these unsubstantiated claims, the facts on the record in this proceeding demonstrate conclusively that the linesharing UNE has been directly responsible for an explosion in broadband deployment, and a pro-consumer reduction in broadband prices, since 1999. Not only is broadband deployment exploding overall, but also digital subscriber line (DSL) services in particular are posting heretofore unseen growth levels. Just this week, on the third anniversary of the FCC's Linesharing Order, Telecommunications Reports released its quarterly Online Census, which found that the growth of the DSL customer base in the U.S. is significantly outpacing cable modem services. For example, DSL customers now make up more than 43 percent of broadband subscribers – up from 33 percent only one year ago.[1] Today, 6.5 million Americans subscribe to DSL services, a growth rate of more than 47 percent since March 1 of this year (compared to only 12 percent cable modem growth), and a growth rate of 83 percent in the last year (compared to 62 percent cable modem growth).[2]

In short, the three short years since the FCC required incumbent LECs to unbundle the upper frequencies of loops has been marked by unparalleled growth in DSL services in this country. Consumers and small businesses have been the beneficiaries of the Commission's linesharing rules: as the attached declaration sets out, consumer welfare of over ***one*** *billion dollars* is the direct consequence of linesharing rules. The simple explanation for this consumer welfare is competition: in a competitive market, all players have incentive to deploy service as widely as possible and offer competitive

[1] TR Online Census **at** I **(attached).**
[2] *Id.*

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prices and innovative services to woo potential customers. As Covad has argued to the Commission in great detail, DSL competition is only possible through linesharing, and that basic fact is unchallenged on the record.

In order to ensure that the Commission has the best possible economic data available on the record in this proceeding, Covad hereby submits the analysis of economists Stephen Siwek and Su Sun of Economists, Inc. These experts analyze the consumer welfare benefits of the FCC's linesharing rules, and conclude that consumers have already enjoyed over a *billion dollars* in economic benefit from linesharing, and that benefit will continue to grow only if the FCC's linesharing rules remain in place. In addition, the attached declaration examines the benefits of linesharing to deployment of both ILEC and CLEC broadband services, and concludes that a broadband duopoly – which would result if the FCC were to eliminate its linesharing rules -- would lead to higher prices and decreased deployment of broadband services. In short, this expert economic analysis reaches the same conclusions that the Commission Itself has reached in numerous proceedings – the broadband competition made possible by linesharing is bringing consumers lower prices, innovative service offerings, and widespread broadband deployment from a variety of facilities-based providers, incumbents and competitors alike.

Please do not hesitate to contact me if I can provide any further information

Respectfully submitted,

Jason D. Oxman

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of

Review of the Section 251 Unbundling Obligations of Incumbent Exchange Camers	)	CC Docket No. 01-338
Implementation of the Local Competition Provisions of the Telecommunications Act of 1996	)	CC Docket No. 96-98
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147

DECLARATION OF STEPHEN E. SIWEK AND SU SUN
ECONOMISTS INCORPORATED
WASHINGTON, DC

NOVEMBER 2002

I. Introduction

A. Qualifications

1. My name is Stephen E. Siwek. I am a Principal at Economists Incorporated, a private research and consulting firm specializing in the economic analysis of antitrust, regulation, and economic damages issues. The firm is located at 1200 New Hampshire Avenue, NW, Washington, D.C. 20036.

2. My areas of specialization include the assessment of lost profit damages, the economic pei-formance of US industries that depend on copyright protection, and the economic and financial analysis of telecommunications and other regulated industnes. I have been continuously involved in consulting since 1975, and 1 have testified as an expert witness on more than 60 occasions before regulatory bodies and courts.

3. I am experienced in the economic and financial issues that are relevant to the analysis of telecommunications pricing, costing and competition. 1 have testified as an expert witness on telecommunications issues before the state regulatory commissions of Arizona, Utah, Connecticut, Wyoming, Pennsylvania, West Virginia, Minnesota, Iowa, Maryland, the District of Columbia, California, Illinois, Massachusetts, Louisiana, New

Jersey, Delaware, New Mexico, Maine, Vermont. New York, New Hampshire, Colorado, Rhode Island and Arkansas.

4. I have also testified in court proceedings where telecommunications products or services were at issue. I have testified in such matters in U.S. District Courts and in state courts in Florida, Maryland, Tennessee, the District of Columbia, Pennsylvania and New Jersey. Finally, I have submitted affidavits and declarations to the Federal Communications Commission in a variety of proceedings including two recent complaint proceedings before the Market Disputes Resolution Division of the Enforcement Bureau.

5. I hold a Bachelor of Arts (Economics) from Boston College and a Master of Business Administration from the George Washington University in Washington DC. My testifying experience and the publications that I have written are summarized in Appendix 1.

6. My name is Su Sun. I am a Senior Economist at Economists Incorporated. My areas of specialization include economic analysis of electricity, natural gas and other regulated industries, assessment of competitive impact of mergers and acquisitions, economic modeling of firm competition, and econometric analysis of damages. I have been involved in consulting since 2000.

7. I am familiar with the methodology of evaluating consumer savings from government policies. I have co-authored an article evaluating the antitrust agencies' estimates of consumer savings from their merger enforcement. [1]

8. I hold a Bachelor's degree in economics from the Renmin University of China and a Master's from the Ohio State University. I have reached the Ph.D. candidacy and expect to receive my Ph.D. from the University of Michigan in 2003. My experience and publications are summarized in Appendix 2.

B. Covad's DSL Services

9. In this proceeding, we are representing Covad Communications Company ("Covad"). Covad is a leading national broadband service provider of high-speed Internet and network access using digital subscriber line ("DSL") technology. Covad offers DSL. T-1, managed security, IP and dial-up services directly and through Internet Service Providers, ("ISPs") resellers and telecommunications carriers.

10. Covad's best-selling DSL offering is known as Asymmetric DSL ("ADSL"). Other forms of DSL service include HDSL (high speed digital subscriber line), UDSL (universal digital subscriber line), VDSL (very-high speed digital subscriber line), and RADSL (rate-adaptive digital

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[1] Philip Nelson and Su Sun, *Consumer Savings from Merger Enforcement: A Review of the Antitrust Agencies' Estimates*, Antitrust Law Journal, Vol. 69, Issue 3.2002.

subscriber line). Covad's "TeleSpeed" service utilizes SDSL (symmetric digital subscriber line) technology to provide business subscribers with equally fast upload and download speeds.[2]

11. Covad's DSL services are currently available to small and medium sized businesses and home users in **94** of the largest Metropolitan Statistical Areas ("MSAs") in the United States. Covad's network currently covers more than 40 million homes and businesses and reaches nearly 45 percent of all homes and businesses in the United States.[3]

12. ADSL broadband service offers consumers and small/medium sized businesses high-speed connectivity over unbundled loops and through line sharing and unbundled interoffice transport. Covad maintains collocated facilities in over 1800 central offices and serves over 350,000 customers nationwide.[4]

13. Loops are the "transmission facility between **a** distribution frame (or its equivalent) in an incumbent LEC central office and the loop demarcation point at an end-user's customer premises, including inside wire owned by the incumbent LEC."[5] Loops that are compatible with DSL signals are no different than the copper loops over which Incumbent Local Exchange Carriers ("ILECs") offer POTS and other voice services to end users

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[2] See http://www.covad.com/businessservices/telespeed.shtml.

[3] Comments of Covad Communications Company, April 5.2002, page **5.**

[4] Id. page 6.

[5] 47 C.F.R. 51.319(a)(1).

except that they do not contain load coils or excessive bridge tap. Load coils in particular are used to compensate for signal decline when a local loop exceeds 18,000 feet in length. In the longest loops, ADSL service cannot be provided. However, at loop lengths below 18,000 feet, different companies provide different offerings with Covad generally providing service at greater distances than that available from ILECs. Engineers can differ in their assessment of the feasibility of providing DSL service to a given subscriber. For this reason, the length of a customer's local loop can in fact determine whether that customer has one or more than one potential provider of DSL service to his home or business.[6]

14. In line sharing, the high frequency spectrum needed to provide broadband DSL service travels over the same physical facility that the ILECs use to provide local telephone service to end users. In providing its ADSL service, nearly all of Covad's residential customers are served over loop facilities that are shared with the local ILEC. A significant number of Covad's small office/home office ("SOHO") customers are similarly served over line-shared loops. In these arrangements, the ILEC continues to provide voice telephone services to the same customer.

C. Summary

[6] It is my understanding, that rhe ILECs generally will not provision ADSL at loop lengths above 15,000 feet but that Covad routinely will offer to provision ADSL services at loop lengths beyond 15.000 feet where it is technically feasible to do so.

15. In this declaration, we address four issues that relate to the DSL data services that CLECs and ILECs currently provide over shared lines to residential and small business customers in the United States.

16. First, we analyze the competitive significance of CLEC-provided data services such as DSL, in relevant product markets for internet-access and for broadband internet-access services to residential and small business subscribers in the US.[7] In this analysis, we review and present subscriber statistics, pricing data, customer survey data and other relevant information relating to the following alternative services: non-broadband, dial-up services, fiber to the home alternatives, satellite and fixed wireless services, cable modem services and ILEC-provided DSL services.

17. Among other things, wc document the extent to which lack of competition plus the potential "cannibalization" of ILEC second line revenues for 56 Kbps, dial-up access acted to delay ILEC expansion into DSL services throughout the mid-1990s. Prior to 1996, there were also significant pressures for the ILECs not to deploy DSL, lest it cannibalize other, more lucrative forms of higher-speed access including T1 and ISDN services.

18. We also show how CLEC-provided DSL services played a critical role in increasing the availability of broadband Internet access services to residential and small business consumers throughout the United States.

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[7] For a variety of reasons, the definition of an appropriate market for the Commission's current purposes may not necessarily he the same as it would he in other contexts. Because the statutory mandate in Section 706 of the Telecom Act is to focus on the deployment *of* "advanced telecommunications capability," and the issue is the ability to provide advanced technology, we focus on why CLEC-provided DSL *is* essential to reasonable competition in providing such (broadband) services. In fact, the ILEC's control over access to the Internet is even greater than their control over broadband access.

19. Our competitive analysis also demonstrates that where available. cable modem service increasingly represents the only real broadband alternative to DSL service for most residential customers. Importantly, the dominant providers of both of these inter-modal technologies offer broadband not as the primary focus of their business, but as an "add-on" service. For this reason, the incentives of these dominant firms to deploy new technologies, to enter new regions and to satisfy the demands of both wholesale and retail customers are inevitably balanced against their dissimilar and even contrary incentives to preserve profits in the regulated voice telephone and cable TV markets. We conclude that CLEC-provided intra-modal competition in DSL service has been and will be critical to advancing the deployment of broadband infrastructure and services in the United States.

20. Second. we analyze the implications of the findings set forth above in terms of their implied market concentration levels. **As** set forth in the *Horizontal **Merger Guidelines*** of the US Department of Justice and the Federal Trade Commission ("FTC"), the more concentrated the market, the greater the ability of participants to raise prices above competitive levels and to reduce output below competitive levels. In this analysis, we show that, under any reasonable set of market shares as between ILEC-only DSL services (i.e. no DSL competition)[8] and cable modem services, the resulting concentration levels remain far higher than the concentration

[8] For example. the absence of line sharing may literally force all remaining CLEC competition out of business as ILECs raise their rivals' costs beyond the point of competition. Another possibility is that it will force prices back up to the point where the ILECs exact a non-competitive rent without actually affording their competitors a profit. In either event, the elimination of line sharing should be assumed in order to take CLEC Competition out of the equation.

levels that, in merger analysis, the Justice Department and FTC would recognize as "highly concentrated" markets.

21. We also demonstrate that if the circumstances were reversed and an ILEC now sought to increase concentration for Internet access and broadband Internet access, through the acquisition of a single large and successful CLEC, the US antitrust authorities would almost certainly oppose such a transaction because the increased concentration that would result from the proposed merger would dramatically exceed the *Horizontal Merger Guidelines*.[9] Accordingly, we conclude that absent CLEC competition in DSL services, there is little reason to believe that ILEC prices will ever be set at or even near competitive levels. We also show how continued CLEC entry into the Internet access market should dramatically improve concentration levels and thereby increase consumer welfare through lower prices and greater service availability and innovation.

22. Third, we evaluate the likely impact that line-sharing-based DSL services will have on future investment levels for DSL services in the United States. We explain that because of the extreme concentration levels that now exist for broadband services in the US, absent line sharing, there is little reason to believe that future ILEC investment in DSL equipment would even remotely approach the investment levels that the ILECs would be required IO make in order to compete successfully with CLECs in DSL

[9] Note that rhe potential acquisition o f a small or unsuccessful CLEC might be unchallenged by the antitrust authorities if such an acquiririon added little appreciable change to market concentration levels (e.g. a change in HHI of less than 50 points) or conceivably because such a CLEC mighr represent a failing firm.

markets. Competition not only lowers prices, it enlarges markets and larger markets in turn require increased investment.

23. Moreover, even if one were to accept the ILECs' so-called ***Investment Deterrence Hypothesis,*** that hypothesis would clearly not hold for the line-shared portion of existing local loops. Loop investments that have already been made arc sunk and will not be affected by emerging policy changes with respect to line sharing.[10]

24. Accordingly, the existing local loop plant will continue to exist and it is reasonable to assume that with line sharing, future investments by ILECs and CLECs combined will increase significantly as compared with an alternative scenario in which line sharing were not permitted.

25. Fourth, we quantify the benefits to residential and small business consumers from CLEC entry by conservatively estimating realized and expected gains in consumer surplus. This methodology is supported by microeconomic theory and is used by antitrust agencies to quantify consumer savings from merger enforcement. Our estimates show that from 1999-2002, CLEC entry resulted in over $1 billion of benefits to residential and small business customers using the ADSL service. Our estimates also show that in the coming four years from 2003-2006, competition from CLECs using line sharing will result in least another $1.6 billion of benefits to such consumers.

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[10] In addition. the denial of CLEC ability to access unbundled ILEC fiber-fed loops would likely affect total investment negatively in markets served by such loops. Absent unbundling of such loops, prices would not decline to competitive levels, output would not increase and new investment would not be required to meet higher demand for low priced DSL services.

11. Internet and Broadband Access Service Alternatives

A. Internet Access Services

26. From the earliest days of the Internet, residential and small business telephone subscribers generally relied not on broadband technology, but on narrowband 56 Kbps dial-up facilities and ISDN lines to send e-mail and to reach the world wide web. Dial-up access grew particularly popular in the mid to late-1990s when ILEC annual access line growth nearly reached annual double-digit rates.

27. As shown in Schedule 1, the Bell Operating companies reported 120,909,662 pre-subscribed access lines in 1996 while, in the same year, all carriers reported 135,122,838 analog main access lines. By 1998 however, the Bell companies were reporting 138,488,145 loops (an increase of 17.6 million lines or more than 14.5%). In the same year, all telephone camers now reported 143,728,291 analog main access lines (an increase of 8.6 million lines of 6.4%). Much of this profitable growth in ILEC access lines was clearly driven by the emerging demand for dial-up access to the Internet during this time frame.

28. In more recent years however, with the introduction of competitive broadband technologies by cable television providers and by CLECs, consumer demand has begun to shift away from narrowband dial-up access and *in* favor of broadband access to the Internet. This evolution in the marketplace has tended to reduce ILEC access line growth relative to years past. From 1998 to 2000, analog main access lines reported by all camers have increased by only 1,696,660 lines or 1.1%. (See Schedule 1).

29. Nevertheless, many US households still use dial-up services for Internet access. According to 2001 data that are reproduced in Schedule 2, the percent of US families that used dial-up access in 2001 exceeded 80% of all US households that reported Internet access of any kind. While the dial-up penetration rate appeared to vary by region (highest in the Midwest and South, lower in the Northeast and West) this basic penetration rate in excess of 80% did not vary appreciably as afunction of family income. (See Schedule 2). As these data reveal, the number of US households that still rely on 56 Kbps Internet access far exceeds the number of US households that use non-dial-up Internet access of any kind.[11]

30. Interestingly, the technologies needed by the ILECs to deploy commercial broadband DSL services were available well before the ILECs began to realize the financial benefits of second line growth for dial-up access. For example, DSL service was first contemplated by Bell Atlantic in October 1992. (See Schedule 3) However, Bell Atlantic chose not to deploy DSL services commercially until October 1998, some six years later. In the interim period, cable companies and more importantly CLECs (occasionally known as "DLECs") had already launched broadband.

31. As shown in Schedule 3, during the thirteen-month period October 1996 through November 1997, consumers in the Bell Atlantic states witnessed

[11] See also *Hearing Designation Order.* In the Matter of Application of EchoStar Communications Corporation (a Nevada corporation), General Motors Corporation, and Hughes Electronics Corporation and EchoStar Communications Corporation (a Delaware Corporation), FCC CS Docket No. 01-348, Adopted October 9,2002, Par. 221. (Hereinafter "EchoStar").

the launch of cable modem services by Time Warner, Cablevision Systems, Media One and Adelphia. In the same time frame, only one CLEC, Vitts Network, deployed DSL services in a single Bell Atlantic state. Bell Atlantic had no competitive response to these cable entrants throughout this entire period.

32. By contrast, beginning in March 1998, DSL services were launched in the Bell Atlantic states by Covad, HarvardNet and NorthPoint. In response, Bell Atlantic now decided to announce its InfoSpeed DSL service in June 1998 and to rollout its own DSL services in Washington DC and in Pittsburgh beginning in October 1998.

33. The timeline in Schedule 3 clearly establishes two facts with respect to broadband competition in DSL services. First, when faced with multiple competitive entry by cable modem providers, ILECs do not react with competitive alternatives of their own. Second, when faced with multiple competitive entry by non-ILEC DSL providers, the ILECs respond quickly and in multiple markets.

34. By 1998, the ILECs also began to worry about losing the second line revenues that they had acquired back in the mid-1990s. In particular, the ILECs faced (and continue to face) powerful incentives to avoid "cannibalization" of their own second line revenues through the introduction of ILEC DSL. **As** one analyst recently found with respect to SBC, "The cost of a second line, coupled with a monthly payment for

internet access to an ISP approximates the monthly cost of DSL service making it a viable alternative to dial-up service for some consumers."'*

35. Because of the threat of cannibalization, from an ILEC's perspective, the economics of DSL roll-out in the mid-to-late 1990s differed dramatically from the costs and benefits perceived by a CLEC in the same time frame. For the ILECs these economics began to change only when customer substitution to CLEC DSL broadband services began in earnest in the later 1990s.

36. This brief history offers two important lessons: First, it is clear that without the spur of competition, an incumbent carrier will not automatically decide to introduce new and innovative services to customers even if the demand for those services is high. This is particularly true if the new services potentially can "cannibalize" the carrier's existing services, including second-line access and more lucrative ISDN and T-1 services.

37. Second, the comparisons of broadband lines by technology type that are discussed in the next section of this Declaration do not accurately portray each technology's share of the residential and small business markets for Internet access services. In the markets for Internet access services, broadband shares clearly understate the relative importance of the ILECs even today.

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[12] David W. Barden, Banc of America Securities, *SBC Communications Inc. Coverage Initiated with a Rating of Market Performer*, September 20. 2002, page 20.

B. Broadband Internet Access Services

38. In Section 706 of the Telecommunications Act, Congress directed this Commission to encourage deployment of advanced telecommunications capability in the United States on a reasonable and timely basis." As part of that effort, the Commission initiated a data collection program designed to gather information on subscnbership to high-speed services including "advanced services, from wire-line telephone companies, cable providers, terrestrial wireless providers, satellite providers and any other facilities-based providers of advanced telecommunications capability." [14]

39. The Commission released the fifth and most recent such report on July 23, 2002. According to that report, total "high-speed lines" in the United States grew 33% from 9,616,341 lines in June 2001 to 12,792,812 lines in December 2001.[15] (See Schedule 4). In the same time frame, residential and small business "high-speed lines" increased 40.9% from 7,812,375 lines in June 2001 to 11,005,396 lines in December 2001 (See Schedule 4).

40. The dramatic growth rates identified by the Commission in turn combined disparate growth trends from five different broadband technology groups. These were: ADSL; other wire-line services including non-asymmetric DSL and traditional telephone company high-speed services; coaxial cable

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[13] Federal Communications Commission, *High Speed Services for Internet Access: Status as of December 31, 2001*. July 2002, page 1. (hereinafter "FCC Broadband Report")

[14] Id.

[15] A high speed line is a connection to an end user that is faster than 200 kbps in at least one direction.

including the typical hybrid fiber-coax ("HFC") architecture of upgraded cable TV systems; optical fiber to the subscriber's premises (e.g. Fiber-to-the-Home); and satellite or fixed wireless." Line counts for each technology groups are reproduced in Schedule 4.

41. With respect to both the total high-speed line category and the residential and small business high-speed line category, coaxial cable and ADSL were the clear broadband leaders. In total high-speed lines, the Commission now reports 7,059,598 coaxial cable lines (55.2% share) and 3,947,808 ADSL lines (30.9% share) as of the end of 2001. Since June 2001, coaxial cable lines in the total high-speed line category have risen 36.2 % while DSL lines have increased by 46.6%. (See Schedule *4).*

42. The dominance of cable and ADSL broadband technologies is even more pronounced in the residential and small business high-speed line category. For the categories of residential and small business customers combined, the Commission **now** reports 7,050,709 coaxial cable lines (64.1%) and 3,615,989 ADSL lines (32.9%) as of the end of 2001. Since June 2001, coaxial cable lines in the residential and small business category have risen 41.1% while DSL lines have increased by 45.2%. (See Schedule **4).** Thus, according to the FCC, coaxial cable and ADSL together account for approximately 96.9% of the total residential and small business high speed lines in the United States."

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[16] FCC Broadband Report, Table 1, Table 3, fin 2.

[17] Because the data provide one number rhar includes both residential and small business customers together, it actually overstates the effect of cable competition. For several reasons. including the fact that cable is primarily a medium for television and never focused its build **out** on businesses. and the fact that

Fiber to the Home

43. As shown in Schedule 4, there are now 494,199 fiber-to-the premises high-speed lines in place in the United States as of the end of 2001. Importantly however, there arc now only 4,139 fiber-to-the-home lines in place at residential and small businesses in the United States. The FCC's report that there are only 4,139 fiber-to-the-home lines out of 11,005,396 total residential and small business broadband lines is significant. Fiber represents less than one-tenth of one percent of residential and small business broadband services. Clearly, with only one tenth of one percent penetration, fiber-to-the-home simply does not provide a viable competitive alternative for residential and small business customers in the United States.

Other Wire-line Services

44. Other wire-line broadband services represent another broadband technology category reported by the FCC. However, this category combines traditional telephone company broadband offerings with emerging non-asymmetric forms of DSL service.[18] For this reason, the reported trends combine technologies of different vintages and capabilities and are, for that reason, difficult to interpret.

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security and speed degradation problems pose even more significant problems for business customers than they do for residential, cable is not a meaningful alternative for small businesses at all. Accordingly. to the extent that the existence of small business competition is fueled by the existence ot line sharing, the prospect without line sharing is no alternative besides the ILEC.

[18] As noted earlier in this Declaration, Covad's own "TeleSpeed" service features Symmetric Digital Subscriber Line ("SDSL") technology.

45. Nevertheless, in the total high-speed line category, the FCC reports 1,078,597 "other" wire-line facilities in place in December 2001, a decline of more than 9,000 lines since June 2001 (See Schedule **4).** For the combined residential and small business category, the FCC reports 139,000 other wire-line broadband lines, a more dramatic decline of 36,860 lines 21% since December 2000. While this technology's share of lines remained above 1% of all residential and small business customers, recent declines in the absolute line counts for other wire-line services clearly suggest that at least some of the disparate technologies included in this category are in rapid decline for the residential and small business broadband sector.

46. We suspect that in 2001, the traditional telephone company high-speed services within the other wire-line category were rapidly losing favor, while ILECs delayed CLEC deployment of symmetric forms of DSL services.

47. It is also worth noting again that Covad competes with ILECs for business customers and has long offered SDSL services to business customers in direct competition with ILECs, who have chosen not to make SDSL service offerings themselves.

Fixed Wireless and Satellite

48. **As** shown in Schedule 4, the FCC reports 212,210 satellite or fixed wireless broadband lines (1.7% of total high-speed lines) in the total high-speed line category as of the end of 2001. The Commission also shows 194,897 satellite or fixed wireless broadband lines (1.8% of residential and

small business high-speed lines) in place to serve residential and small business subscribers. As with the "other" wire-line category, the satellite and fixed wireless grouping combines disparate technologies. It is not clear what percentage *of* these totals represents fixed wireless services and what percentage represents satellite services. Nevertheless, even on a combined basis, the FCC's own statistics show that the two technologies account for well under 2% of total residential and small business broadband Internet access services in the United States.

49. Focusing initially on fixed wireless services, it is clear that recent changes in the investment climate for telecommunications firms in general, have dramatically reduced the number and financial viability of the major fixed wireless players in the United States. It is important to note that carriers such as Winstar and Teligent attempted to create powerful wireless nerworks that were targeted not at residential and small business customers, but at large business and government customers.[19] Importantly, many of these carriers have more recently decided to restructure their fixed wireless businesses or to stop selling wireless entirely.

50. In Schedule 5, we reproduce various press releases relating to the fixed wireless operations of AT&T, Winstar and Telegent. As shown in Schedule 5, AT&T shut down its money losing fixed wireless business (formerly known as "Project Angel") in late October 2001. At its height, the AT&T fixed wireless operation had 47,000 customers.

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[19] See Joint Declaration of Anjali Joshi, Eric Moyer. Mark Richman, **and** Michael Zulevic on Behalf of Covad Communications, Par. 22. (Hereinafter "Joshi et.al.")

51. In March *2002,* IDT Corp. announced that its Winstar Communications unit would exit the fixed wireless business in smaller markets and the wire-line telephone business as well. While Winstar would continue to expand its fixed wireless business to large building customers, the company also announced that it would cut its non-sales workforce by 65%.

52. In *2002,* fixed wireless carrier Teligent filed for protection from its creditors under Chapter 11. In May 2002, Teligent revealed a proposed reorganization plan under which the company's secured lenders and its bank creditors –led by Chase Manhattan Bank would own stock in the combined company.

53. Importantly, the fixed wireless services offered by these struggling firms generally were not even directed toward the needs of residential and small business customers to access the Internet. For the most **part,** they were aimed instead at large businesses. For all of these reasons, it is clear that fixed wireless services do not now provide a viable competitive alternative to residential and small business broadband customers in the United States.

54. As regards broadband Internet access services by satellite, the Commission itself has recently had occasion to analyze this alternative in considerable detail. In its recent Hearing Designation Order in the *EchoStar* matter, the Commission found that; "While most residential Internet access service is provided over narrowband connections, Americans are increasingly subscribing to broadband Internet access. Such services today are predominantly provided by cable operators using cable

modem technology, and secondarily by telecommunications carriers using DSL. By contrast, current satellite-provided Internet access services constitute only a small percentage of all Internet service accounts."[20] (Emphasis added).

55. In its ***Order.*** the Commission found that "current Internet access services provided with the Applicants' Ku-band systems may exceed 200 Kbps only in the downstream direction-upstream transmissions are advertised as approximately 128 and 150 Kbps."[21] Indeed, limits on transmission speed is but one of many technical issues now facing satellite broadband technology. Many current satellite services do not even provide two-way communications paths. Home satellite dishes are frequently too small to provide adequate bandwidth in the upstream direction and service providers use telephone lines to provide two-way communications.[22]

56. While it is true that satellite broadband services could, in principle, provide viable Internet access to the millions of **US** households that do not now have access to DSL and cable modem services, the actual commercial value of current (Ku-band) satellite broadband service offerings seems quite limited indeed.[23] In describing these services EchoStar/DirecTV characterized their own current broadband offerings as "..expensive

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[20] EchoStar Order. Par. 221

[21] EchoStar Order. Par. 223

[22] Joshi et.al., Par. 24.

[23] In the EchoStar matter, the Applicants claimed that more than 40 million households currently lack access to DSL and cable modem services. See EchoStar Order, par. 232.

'niche' products that are hampered by several constraints, do not even satisfy the Commission's definition of an 'advanced service' and have attracted fewer than 150,000 subscribers combined."[24] The Applicants concluded that "Satellite broadband today is not fully comparable to cable modem and DSL..."[25]

57. It is also worth noting that even the deployment of new Ka-band satellites does not appear to offer much in the way of potential new options for broadband Internet access. In its *EchoStar* Order the Commission also considered this possibility and resolved it as follows. "Applicants' position that the merger will result in increased deployment of satellite broadband services is based primarily on the projected provision of broadband Internet services using Ka-band spectrum. Such services, however, are not only nascent, in nearly every case they are months, if not years away from public availability. The facilities to deploy broadband Internet access service using Ka-band spectrum are not yet deployed. Substantial uncertainties remain as to the likely quality and prices of such services"[26] (Emphasis Added).

Cable ***Modem Services***

58. **As** shown in Schedule 4, there are 7,059,598 coaxial cable high-speed lines in place in the United States as of the end of 2001. Cable modem

[24] EchoStar Order, f/n 568 quoting Applicants' Reply Comments at iv.

[25] EchoStar Order, f/n 568 quoting Applicants' Reply Comments at 85

[26] EchoStar Order, **Par.** 247.

lines have grown by more than 36% since June 2001 and the technology represents 55.2% of the total high-speed lines in the **US.** In the residential and small business sector, there are 7,050,709 cable modem high-speed lines or 64.1% of the total residential and high-speed line reported by the FCC as of the end of 2001. Comparing the number of coaxial cable broadband lines in the residential and small business high speed line category to the cable modem line counts in the total high speed line category, one can calculate that 99.9% of coaxial cable lines for broadband Internet access serve residential or small business customers. This percentage is not surprising since the original wiring of cable TV networks targeted residential customers and not commercial business centers.[27] The inability of cable broadband services to reach many business Subscribers is one of a number of ways in which coaxial cable services differ from DSL services.

59. The National Cable & Telecommunications Association ("NCTA") reports somewhat higher (and more current) figures for cable modem subscribers in the United States. According to NCTA figures, (See Schedule 6) there were 9,200,000 cable modem subscribers in the United States on June 30,2002. The Association also estimates that there are 16,800,000 digital cable subscribers in the US and that 75,000,000 **US** home are now passed by cable modem service (Schedule ***6).***

*ADSL **Services***

[27] Joshi et. al. Par. 15.

60. In its most recent filing the FCC reports that there are **3,947,808** high-speed **ADSL** lines in place in the United States as of the end of **2001** (Schedule **4**). **ADSL** lines have grown by more than 46% since June 2001 and the technology now represents **30.9%** of the total high-speed lines in the US. In the residential and small business sector, there are now **3,615,989** high-speed **ADSL** lines or **32.9%** of the total residential and high-speed line reported by the FCC. **As** these statistics illustrate, in 2001, the ratio of cable modem lines to **ADSL** lines in the United States was approximately **1.8-to-1.0** This shortfall in part reflects the consequences of ILEC delays in the deployment of **DSL** technology as described earlier in this Declaration, and, Covad believes, anticompetitive action that thwarted CLEC competition. Nevertheless, since June 2001, **ADSL** lines are increasing more rapidly than cable modem lines in the total high-speed line category (**46.6%** growth for **ADSL** vs. **36.2%** growth for cable modems) and in the residential and small business high-speed line category (45.2% growth for **ADSL** vs. **41.1%** growth for cable modems).

*Combined Share: **ADSL** and Cable Modem Services*

61. The FCC reports cited above clearly demonstrate that the two broadband technologies of **ADSL** and cable modems now dominate residential high speed Jnternet access. In the total high-speed line category, **ADSL** plus cable modem lines account for **86.0%** of total high-speed lines (Schedule **4**). In the residential and small business high-speed line category, ADSL plus cable modem lines account for an astounding **96.9%** of the total residential and small business high-speed lines in the United States. In view of these figures, it is clear why the Commission could conclude, as it

did in the *EchoStar* Order, that broadband Internet access services are "..predominantly provided by cable operators using cable modem technology, and secondarily by telecommunications carriers using DSL."[28]

C. **DSL vs.** Cable Modems: Features **and Prices**

Features

62. In a recent Jupiter/NPD customer survey (See Schedule 7), home Internet users were asked about the types of Internet access that they relied on and the service feature that were most important to them. Mirroring the NTIA statistics cited previously in this Declaration, 78.4% of the respondents reported that they connected to the Internet using a dial-up connection, 8.4% reported use of **a** cable modem while another 4.4% of respondents used ADSL. (Schedule 7).

63. The same respondents reported that the most important advantage they perceived from using their current Internet Service Provider ("ISP") was that the ISP provided a local telephone number for access. The next two most important advantages were "ease of establishing connection" and "lowest price." With respect solely to "broadband' Internet services, the features that respondents found most appealing included; "downloading a web page instantaneously," "having a computer always connected to the Internet," and "downloading large files (such as MP3, music video, software) faster. **As** these responses indicate, Internet users value ease of

[28] EchoStar Order, Par. 221

connection to the Internet, always-on connections, low prices and download speed.

64. When considering the features of ADSL and cable modem Internet access, it is useful first to set aside an important similarity between the two services. Both ADSL and cable modem services differ from conventional 56 Kbps dial-up access in that both ADSL and cable modems are "always-on." In this respect either service provides a dramatic improvement over dial-up modem services where, as noted above, ease of connection is a major concern of many Internet access customers.

65. Other Internet access features noted above that were of particular importance to broadband users included "downloading a web page instantaneously" and "downloading large files." These concerns fundamentally relate to download speed and in this respect, the ADSL and cable modem technologies are somewhat difficult to compare. Cable modem technology features "shared" bandwidth while ADSL provides access over "dedicated" bandwidth. This distinction is fundamental to the two technologies and gives rise to conflicting claims as regards download speed.

66. With a shared bandwidth network, the quality of service will tend to degrade during peak hours. In addition, since the capacity limits of cable networks exist at the neighborhood level rather than at the backbone level, it is more difficult in cable networks to engineer for the peak traffic loads that will actually affect the user's experience. For certain broadband applications, such as on-line computer games and home offices, the peak hour service degradation problems associated with cable moderns can be

serious. By contrast, ADSL users do not share bandwidth with each other in their local access lines and connection speeds remain more consistent throughout the day. Cable modem networks can also be subject to service interruptions. In Schedule 8, we reproduce several comments from cable modem users in a recent Covad-supported survey that highlight these particular difficulties.

67. There are other important differences between ADSL and cable modem services that have been noted in the Declarations submitted by other Covad witnesses in this proceeding. One such difference relates to the lack of security that is both inherent in a shared cable network architecture and of particular concern to small business and home office users. In contrast with cable networks, DSL networks operate on a point-to-point basis between the subscriber and the service provider. DSL networks do not therefore present the same opportunity for one subscriber to view another's traffic.[29]

68. In addition, unlike most cable modem services, a fixed IP address is available with Covad's ADSL service , which facilitates hosting, videoconferencing and virtual private network ("VPN") capabilities. DSL's dedicated connection to the carrier's DSLAM also provides the capability to offer different speeds at different price points. By contrast, cable modem providers typically market a shared connection running at the same speed for everyone.

[29] Joshi et. al. Par. 14

69. Finally, as noted earlier in this Declaration, cable networks often cannot reach business subscribers because cable TV systems originally were established to serve residential subscribers only.

Prices

70. In its recent *EchoStar* Order, the Commission reviewed data submitted by the Applicants regarding average price levels for broadband satellite, ADSL and cable modem services today. According to the Commission, the Applicants "note that the $60 to $70 monthly fee for existing satellite-provided broadband Internet access services is 'significantly' higher than monthly fees for cable modem and standard DSL service, which can be as low as $30 and $45 respectively."[30] Similarly, the Applicants stated that installation fees in excess of $700 for satellite-provided broadband Internet services could be compared to installation fees as low as $200 or $250 for "some cable modem and DSL providers, respectively."[31]

71. Notwithstanding these quotations, more current data suggest that the Commission's price estimates were somewhat low with respect to cable modem services and somewhat high with respect to DSL services. In particular, the Commission's average installation price for DSL services seems much higher than current offerings by the carriers.

72. In Schedule 9, we reproduce two trade press articles from ***Network World Fusion*** and *ZDNET* that describe a cable modem price- restructuring plan

[30] EchoStar Order, Par. 238.

[31] EchoStar Order. Par. *1-38.*

announced by AT&T Broadband in June 2002. **As** these articles explain, in June 2002, the base price in effect for cable modem services provided to nearly all of AT&T Broadband's customers had been $35.95 per month. (See Schedule 9). This "base" price was six dollars per month more than the $30 per month price cited by the FCC in the ***EchoStar*** Order. For those AT&T customers who also chose to rent cable modems from AT&T, the base pncc was $10 more or $45.95 per month. In the restructuring, AT&T announced that, effective July 1, 2002, its base price, without cable modem rental would increase $7 per month to $42.95 per month. This new price is nearly $13 more than the $30 per month price cited by the FCC. AT&T also announced that, for cable modem renters, the company would decrease its rental fee from $10 to ***$3*** per month. Thus, for renters, the total cable modem price would remain at $45.95 per month ($42.95 plus $3.00).

73. In Schedule 10, we reproduce DSL prices levels, speeds and other data reported for DSL providers at an online periodical known as Broadband Reports." At least with respect to Covad, as we explain below, even these price data appear somewhat out of date. Nevertheless, as shown in Broadband Reports, the lowest monthly price reported for any DSL service was the DSL service then provided by Covad featuring 384 Kbps downstream speed and 128 Kbps upstream speed. That service was available for $40 per month with **a** $99 installation fee. In the same source, ILEC DSL services resold by ISPs such as EarthLink and even by Direct

[32] www.broadbandreporrs.com

TV DSL were available for $49 per month with free installation. For its lowest speed DSL service, SBC Pacific Bell and SBC Southwestern Bell each charged $42 per month with a $99 installation fee.

74. In June 2002, Covad reduced its DSL prices below even the price levels shown in Schedule 10. Covad announced that its TeleSurfer Link ADSL product would be priced at $21.95 per month for the first four months and $39.95 thereafter with free equipment and installation with no annual contract.[33] Some months thereafter, SBC announced new DSL pricing at $29.95 for the introductory months and $42.95 per month thereafter.[34]

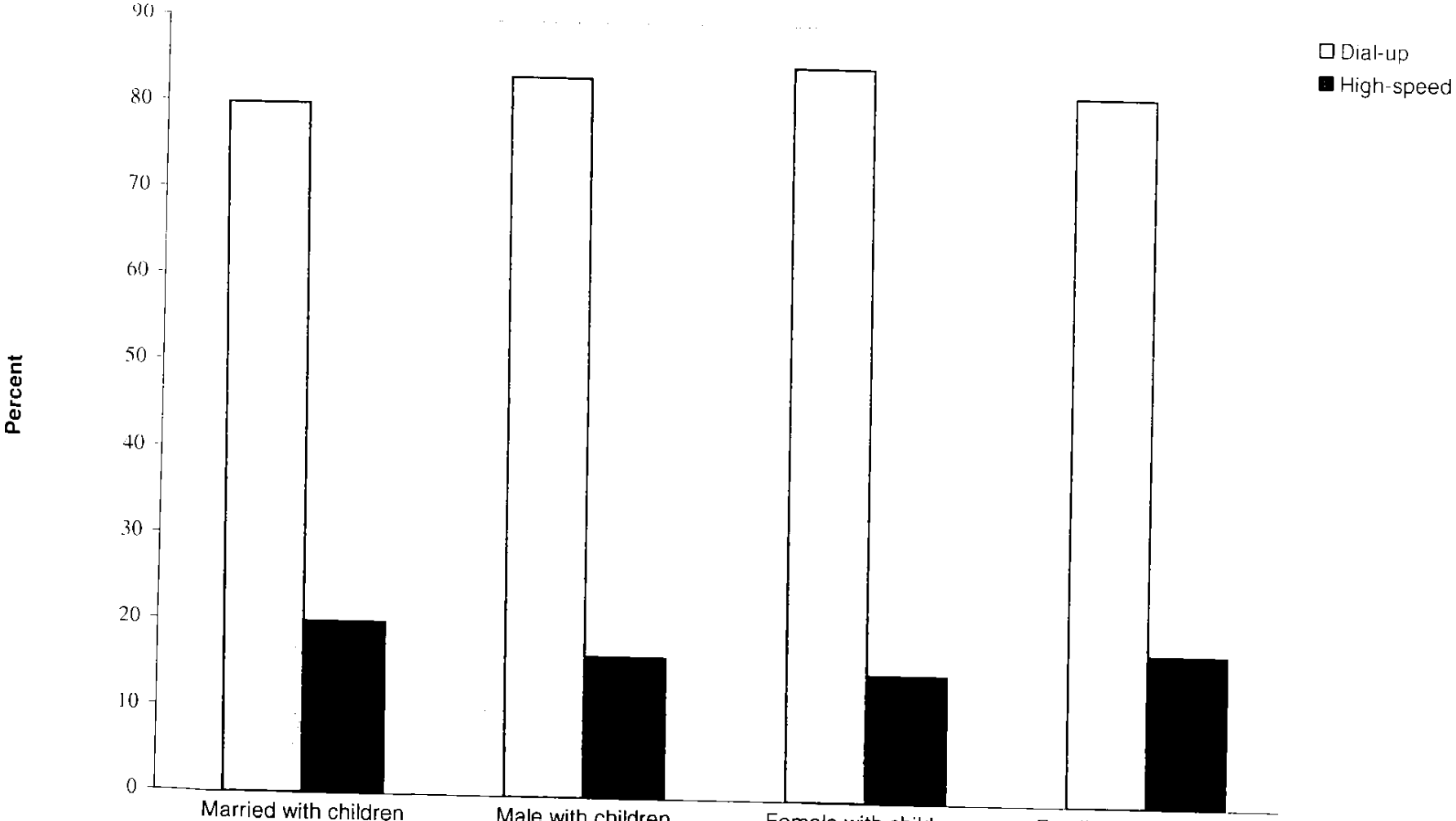
75. As these trends make clear DSL prices are now in a period of rapid decline driven largely, as we argue below, by intra-modal competition from CLECs like Covad.

[33] Letter to William Maher, Chief, Wireline Competition Bureau, Federal Communications Commission from Jason D. Oxman, Vice President and Assistant General Counsel, Covad Communications Company, October 11, 2002, page 4.

[34] Id.

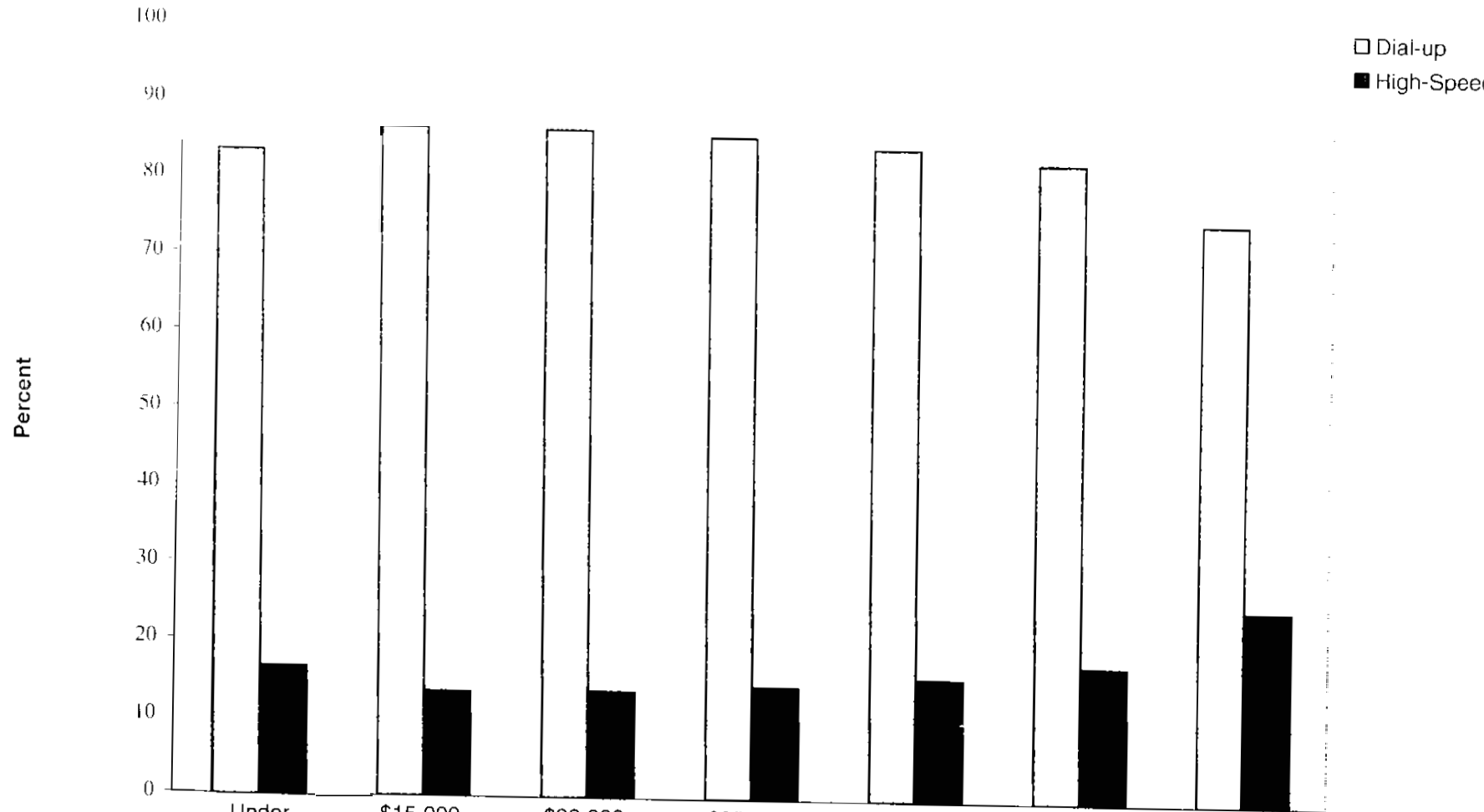
Schedule 2

Percent of U.S. Households with Internet Access, By Access Speed By Type of Household, 2001



Source: NTIA and ESA, U.S. Department of Commerce, using U.S. Bureau of Population
http://www.ntia.doc.gov/ntiahome/dn/hhs/ChartH13.htm

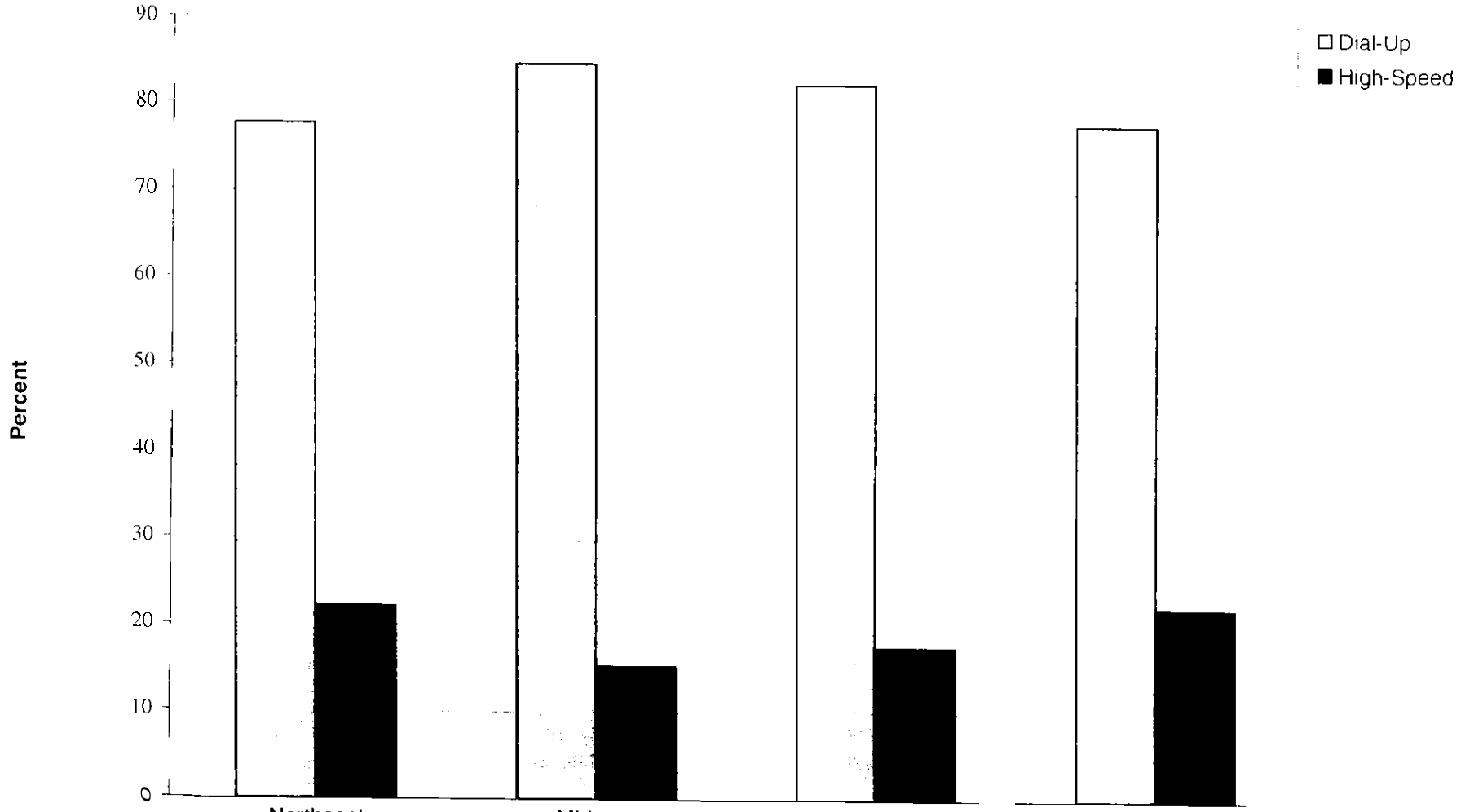
Percent of U.S. Households with Internet Access, By Access Speed, By Income, 2001



	Under $15,000	$15,000-19,999	$20,000-34,999	$25,000-34,999	$35,000-49,999	$50,000-74,999	Over $75,000
Dial-up	83.4	86.4	86.2	85.4	84.1	82.4	74.9
High-Speed	16.7	13.6	13.8	14.6	15.9	17.7	25.1

Source: NTIA and ESA. U.S. Department of Commerce. S. of the Census Current
http://www.ntia.doc.gov/ntiahome/dn/hhs/ChartH12.htm

Percent of U.S. Households with Internet Access, By Access Speed, By Region, 2001



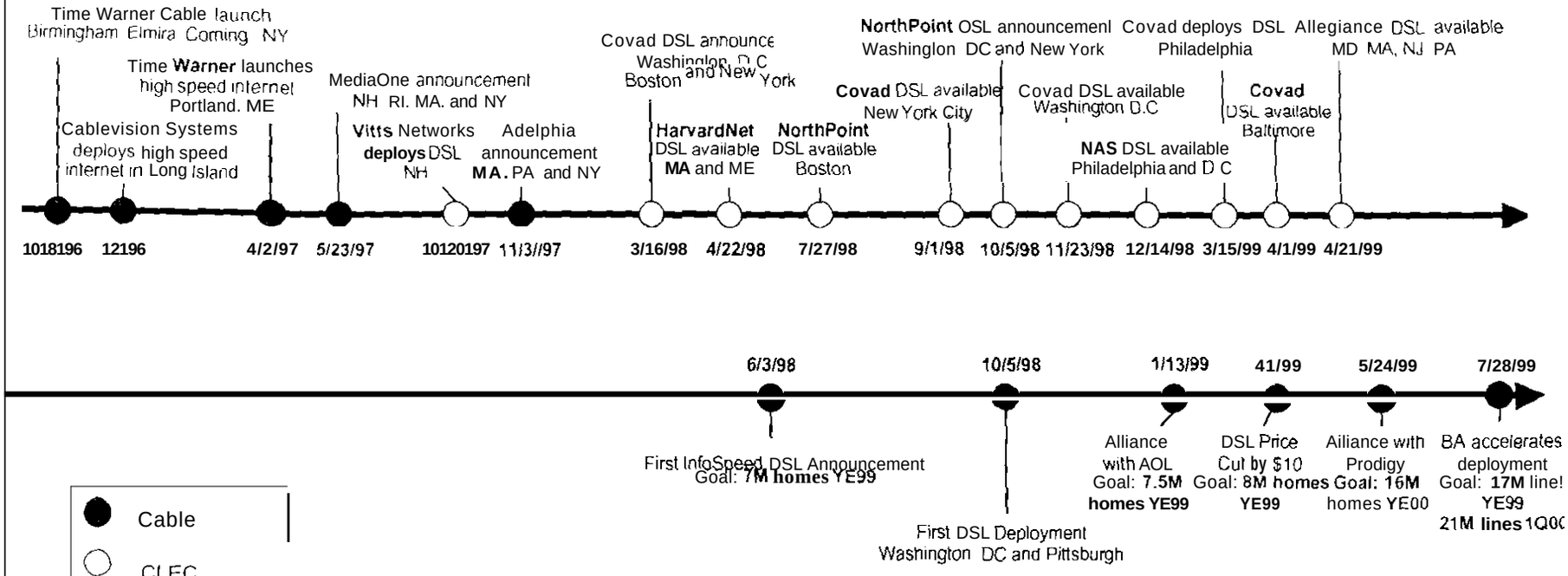
	Northeast	Midwest	South	West
Dial-Up	77.8	84.7	82.4	77.8
High-Speed	22.2	15.3	17.6	22.2

Source: NTIA and ESA, U.S. Department of Commerce, using U.S. Bureau of the Population Sur supplements.
http://www.ntia.doc.gov/ntiahome/dn/hhs/ChartH11.htm

Schedule 3

Broadband Deployment in Bell Atlantic States

***In** October **1992.** Bell Atlantic first contemplated commercial DSL service.*
***In 7997,** new competitors started deploying broadband in Bell Atlantic's territory.*
***In** October **1998,** Bell Atlantic launched "InfoSpeed" DSL.*



Bell Atlantic Deployment

Bell Atlantic Broadband Deployment (cont.)

Bell Atlantic DSL Offerings At a Glance

Bell Atlantic	Download Speeds	DSL Price (w/o ISP)	DSL Price (w/ ILEC ISP Service)
	640 kbps	$39.95	$49.95
	1.6 Mbps	$59.95	$99.95
	7.1 Mbps	$109.95	$189.95

Deployment Goals are Increasing:

6/3/98	7 M homes by YE 99
1/13/99	7.5 M homes by YE 99
3/31/99	8 M homes by YE 99
5/24/99	over 8 M homes by YE 99
5/26/99	10 M lines by YE 99
7/28/99	17M lines by YE99; 21M lines 1Q00

*Prices are Dropping:**

6/3/98	$69.95
10/5/98	$59.95
4/1/99	$49.95

'Prices for 640 **kbps** w/ *Bell* **Atlantic** ISP *service*

Quotes about Bell Atlantic DSL:

- "The prospects of cable modems, and ultimately cable telephony, have clearly spurred Bell Atlantic into action. The company has accelerated its DSL rollout, [has] lower[ed] pricing. is signing wholesale agreement[s] (most notably with AOL...)" (J.P *Morgan, Bell Atlantic: Meetings With Management Reinforce Positive Outlook,* April 8, 1999)

- "We're accelerating the momentum for DSL by making high-quality, high-speed access to the Internet more affordable for consumers..." (Bell Atlantic VP *Myles Mendelsohn* 3/31/99)

Cable:

7/31/95 Service Electric and Blue Ridge Cable announces plans lo deploy broadband services in Eastern PA

9/1/96 Time Warner Cable announces plans to deploy broadband services in Birmingham, Corning, Elmira. Albany. Troy, and Saratoga, NY

10124196 Bedford Cablevision announces plans Io deploy broadband services in Bedford. VA

5/23/97 MediaOne announces plans to deploy broadband services in New Hampshire, Maine, Rhode Island, Massachusetts. and New York

7/16/97 Cable York announces plans *to* deploy broadband Services in York. PA

7/28/97 Helicon announces plans to deploy broadband services in Uniontown, PA and Barre. VT

1012197 Cablevision announces plans to deploy broadband services in New York, Boston. and Virginia

10/28/97 Cox announces plans to deploy broadband services in Newport News, VA

1113197 Adelphia announces plans to deploy broadband services in Plymouth, Adams/N Adams, MA; Coundersport. Mount Lebanon. Lansdale. PA. and Greater Buffalo. NY

12/3/97 Comcast announces plans Io deploy broadband services in Philadelphia, PA

12/8/97 Armstrong Cable Services announces plans to deploy broadband services in Connellsville. PA

5/7/98 Century Communications announces plans to deploy broadband services in Norwich. NY

6/30/98 Jones Intercahle announces plans to deploy broadband services in Washington D C.. Alexandria. and Prince William County, VA

CLEC:

10/27/97 Vitts Networks starts deploying DSL in New Hampshire

3/16/98 Covad announces DSL deployment plans for Washington D.C., Boston, and New York

4/22/98 HarvardNet deploys DSL in MA and ME

7/27/98 NorthPoint launches DSL service in Boston

9/1/98 Covad deploys DSL in NY city

10/5/98 NorthPoint announces DSL deployment in Washington D.C. and New York

11/23/98 Covad launches DSL in Washington D.C.

12/14/98 NAS launches DSL in Philadelphia and Washington D.C.

3/15/99 Covad deploys OSL in Philadelphia

4/1/99 Covad launches DSL in Baltimore

4/21/99 Allegiance deploys DSL in MD. MA, NJ. and **PA**

Schedule 4

Total High-speed Lines 1/
(Over 200 kbps in at Least One Direction)

Types of Technology	December 1999	Share of Total	June 2000	Share of Total	December 2000	Share of Total	June 2001	Share of Total	December 2001	Share of Total	Percent Change Dec 2000 - June 2001	Percent Change June 2001 - Dec 2001
ADSL	369,792	13.43%	951,583	21.79%	1,977,101	27.97%	2,693,834	28.01%	3,947,808	30.86%	36.25%	46.55%
Other Wireline	609,909	22.14%	758,594	17.37%	1,021,291	14.45%	1,088,066	11.31%	1,078,597	8.43%	6.54%	-0.87%
Coaxial Cable	1,411,977	51.26%	2,284,491	52.31%	3,582,874	50.68%	5,184,141	53.91%	7,059,598	55.18%	44.69%	36.18%
Fiber	312,204	11.34%	307,151	7.03%	376,203	5.32%	455,593	4.74%	494,199	3.86%	21.10%	8.47%
Satellite or Fixed Wireless	50,404	1.83%	65,615	1.50%	112,405	1.59%	194,707	2.02%	212,610	1.66%	73.22%	9.19%
Total Lines	2,754,286	100.00%	4,367,434	100.00%	7,069,874	100.00%	9,616,341	100.00%	12,792,812	100.00%	36.02%	33.03%

1/ A high-speed line is a connection to an end-user customer that is faster than 200 kbps in at least one direction. Advanced services lines, which are a subset of high-speed lines, are connections to end-user customers that are faster than 200 kbps in both directions. The speed of the purchased service varies among end-user customers. For example, a high-speed service delivered to the end-user customer over other traditional wireline technology, such as DS1 or DS3 service, or over optical fiber to the end user's premises may be much faster than the ADSL or cable modem service purchased by a different, or by the same, end user. Numbers of lines reported here are not adjusted for the speed of the service delivered over the line or the number of end users able to utilize the lines.

Total Residential and Small Business High-speed Lines 1/
(Over 200 kbps in at Least One Direction)

Types of Technology	December 1999	Share of Total	June 2000	Share of Total	December 2000	Share of Total	June 2001	Share of Total	December 2001	Share of Total	Percent Change Dec 2000 - June 2001	Percent Change June 2001 - Dec 2001
ADSL	291.757	16.285;	772,272	24.41%	1.594.879	30 85%	2,490,740	31 88%	3,615,989	32.86%	56.17%	45.18%
Other Wireline	46.856	2.61%	111,490	3.52%	176.520	3.41%	118.307	1.77%	139.660	1.27%	NM	0.98%
Coaxial Cable	1.402.394	78.25%	2.215.259	70.02%	3.294.546	63 72%	4.998.540	63.98%	7,050,709	61.07%	51.72%	41.06%
Fiber	1.023	0 06%	325	0.01%	1.994	0.04%	2.623	0.03%	4,139	0.04%	NM	NM
Satellite or Fixed Wireless	50.189	2 80%	64,320	2.03%	102.432	1.98%	182,165	2.33%	194,897	1.77%	77.84%	6.99%
Total Lines	1.792.219	100.00%	3,163,666	100.00%	5,170,371	100.00%	7,812,375	100.00%	11,005,394	100.00%	51.10%	40.87%

Note: NM - Not meaningful due to inconsistencies in reponed dara

1/ A high-speed line is a connection to an end-user customer that is faster than 200 kbps in at least one direction. Advanced services lines, which are a subset of high-speed lines, are connections to end-user customers that arc faster than 200 kbps in borh directions The speed of h e purchased service varies among end-user customers For example, a high-speed service , delivered to the snd-user customer over other traditional wireline technology, such as DSI or DS3 service, or over optical fiber io h e end user's premises may be much faster than h e ADSL or cable modem service purchased by a different, or by the same, end user. Numbers of lines reponed here are not adjusted for the speed of h e service delivered over h e line or the number of el users able to utilize the lines

Schedule 5

Seattle Post-Intelligencei

Wednesday, October 24,2001

News

AT&T WIRELESS TO LAY OFF 1,000 ; ITS A DAY OF CUTS FOR HIGH-TECH JOBS

JOHN COOK **P-I** reporter

Redmond-based AT&T Wireless Services Inc. is shutting down its fixed wireless unit, a money-losing division that provided local phone service and high-speed Internet access in nine cities.

About 1,000 people will lose theirjobs as a result of the closure. including as many as 700 in Washington.

That wasn't the only had news yesterday in the state's once high flying tech sector.

Bellevue-based InfoSpace Inc. cui 200 jobs. or 20 percent of its work force, after its third-quarter net loss quadrupled to $201.4 million.

Time Warner Telecom, a provider ol optical broadband networks. cut 250 employees - mostly ai its facilities in Vancouver. Wash. - leaving a staff of 100 people in southwestern Washington and Portland.

And Primus Knowledge Solutions. a Seattle software maker, laid off about 30 percent of its staff on Friday. though a company spokesman declined to discuss the work force reduction until earnings are released tomorrow.

With the job cuts at AT&T Wireless, InfoSpace, Primus and Time Warner Telecom, more than 15,675 people have hccn laid off lrom technology companies in the state this year. Since January 2000, the number stands at 18,880, according to figures compiled by the Seattle Post-Intelligencer.

The WSA, formerly the Washington Software Alliance, estimated that 61,000 people were working in the state's software and Internet industries in September 2000 But that number undoubtedly has dropped *in recent months as dozens of money-losing* Internet, software and telecommunications companies have either chopped staff in attempt lo survive the turbulent climate, or gone out of business

"Numerically, these job cuts are adding up, and we really can only absorb so many," said Roberta Pauer, economist with the state's Employment Security Department.

"A recession comes in all sizes and it is a worrisome word, so one wants to be careful. But this is what a recession is "

Pauer said job growth was essentially flat for the 12-month period through the end of September, with only 2,700 overall jobs being created in the state.

As more companies cut staff, the employment picture is getting darker for laid-off techies, who two years ago were worrying more about stock option packages than pink slips.

An employee who lost his job at Primus Knowledge Solutions this summer - and has yet to find work - tried to put a brave face on the current situation.

"It is a tough market out there," he said. "But I am not panicking about it, and I am not so worried that I am not going to go back into the industry because I am afraid I will get laid off. I am prepared to deal with it."

But with as many as 700 people losing their jobs at AT&T Wireless - one of the largest technology layoffs in the state this year - the climate could worsen.

AT&T Wireless explored options for the fixed wireless division, including a sale, but in the end decided it was better to just shut it down.

AT&T Wireless Chairman John Zeglis said the unit - formed in the mid-1990s under the code name Project Angel - was too expensive and too far outside the company's strategic focus to justify the expenses of keeping it going.

About $400 million was spent on the division each year, a costly endeavor given that it attracted only 47,000 customers and generated just $6 million in revenue in the third quarter.

The service - best known for the small antennas that attached to the sides of homes and businesses - was available in nine cities, including Anchorage, Dallas, Houston, Los Angeles and San Diego. Seattle was not among the nine.

AT&T Wireless attempted to sell the assets of the fixed wireless business earlier this year, but with the poor climate for telecom services the talks "didn't proceed beyond a preliminary basis," said spokesman David Caouette. He said some of its technology and licenses, including fixed wireless towers, can be easily transferred to the company's existing network.

The closure will occur over the next several months through a "phased exit" in which customers will receive "a high level of support," Zeglis said.

He also said the company would attempt to find employment for affected employees both inside and outside AT&T Wireless.

AT&T Wireless, which began notifying employees of the layoffs this

week, will take a $1.3 billion charge in the fourth quarter as a result of the unit's closure.

"It makes a lot of sense," said Simon Reeves, an analyst with Pacific Crest Securities. "It was just a distraction in terms of capital and management's time."

The announcement was made as part of the company's third-quarter earnings release after the markets closed.

AT&T Wireless, the third-largest wireless phone carrier in the country, reported net income of $77 million on sales of $3.5 billion. It also added 748,000 wireless customers in the third quarter.

The company employs 29,000 people, including 6,100 in Washington state.

Shares of AT&T Wireless, which spun out of AT&T Corp. in July, rose $1.26, or 9.7 percent, to $14.20.

The layoffs at Bellevue-based InfoSpace are the second this year, following a work force reduction of 250 people in February. InfoSpace, which delivers content to both Internet sites and wireless devices, has struggled since it acquired Seattle-based Go2Net Inc. in a stock deal valued at $1.5 billion.

Since the acquisition closed last October, InfoSpace's stock has fallen 88 percent, a handful of executives have departed and lawsuits have piled up.

InfoSpace spokesman Adam Whinston said the company is cutting staff because it is focusing on core product areas. He said there are no plans at this time to close any of the consumer-oriented Web sites it operates, including the Silicon Investor chat board and DogPile search engine.

After the cuts, InfoSpace will employ 700 people.

Revenues at the company fell 45 percent during the third quarter to $33.1 million from $59.8 million. The stock closed yesterday at $2.15, up 13 cents.

Time Warner Telecom Inc., which is cutting 250 jobs, said the move is being made to "improve processes and efficiencies."

The Littleton, Colo.-based company, in which AOL Time Warner holds a 44.5 percent stake, will continue to employ 25 people in Seattle, said Bob Meldrum, a company spokesman.

Meldrum said that laid-off employees will receive a "separation package with benefits, outplacement services and severance." The company expects to take a restructuring charge of $6 million to $8 million during the fourth quarter. Time Warner said that the reorganization should save the company $10 million to $14 million a

year.

The Wall Street Journal

Monday, March 11, 2002

Business Brief

IDT Corp.: Winstar to Exit From Some Markets, Trim Work Force

IDT Corp. said its Winstar Communications unit will exit from the wireline telephone business and cut 65% of its nonsales work force in an effort to return to profitability by year end. Under the restructuring plan, Winstar, a provider of local, long-distance and Internet services, will also exit from its fixed wireless business in certain of its smaller markets and consolidate certain facilities and functions with IDT, a Newark, N.J., telecommunications company. At the same time, the plan calls for Winstar to increase the size of its fixed wireless network by adding about 600 buildings in the 22 cities in which it is maintaining its wireless operations. With the addition of these buildings it will have about 4,000 buildings on its network. Winstar also plans to expand its sales force. As part of the plan, responsibility for many overlapping functions will be assumed by IDT personnel, principally at IDT's headquarters in Newark, and its engineering center in Piscataway, N.J. This will result in the transfer of Winstar's customer-service operations to an alternate facility.

---- INDEX REFERENCES ----

COMPANY (TICKER): IDT; IDTB (IDT IDTB)

NEWS SUBJECT: Corporate Actions; Corporate/Industrial News; Labor Issues; Labor Issues; Restructurings & Recapitalizations; Dow Jones Total Market Index; Wall Street Journal; English language content; Plans/Strategy; Political/General News (CAC CCAT LAB GJOB RCN WEI WSJ ENGL C11 GCAT)

MARKET SECTOR: Utilities; Newswire End Code (UTI NND)

INDUSTRY: Long Distance Telephone Providers; Telecommunications, All; Telephone Systems (LDS TEL TLS)

REGION: New Jersey; United States - New Jersey; North America; United States; United States; Northeast U.S.; North American Countries (NJ USNJ NME US USA USE NAMZ)

LAYOUT CODES: Minors (MNO)

Word Count: 174

3/11/02 WSJ B5

END OF DOCUMENT

5/30/02 WASHPOST E05
5/30/02 Wash. Post E05
2002 WL 21748003

Thursday. May 30, 2002

Financial

IN BRIEF

* MainControl, a McLean firm that sells technology management software, agreed to be bought by MRO Software, a Bedford, Mass., company that offers similar products, for about $19 million. MRO said it will buy MainControl's outstanding equity for 1.1 million shares of its stock and $3.5 million. Sixty-five to 70 of MainControl's 100 employees will join MRO, including chief executive Alex Pinchev. MRO said the addition of MainControl's software will expand its ability to manage types of technology and systems for clients. The purchase is expected to close in the next three weeks. Shares of MRO closed at $13.72, down 38 cents.

* Micros Systems, a Columbia hospitality technology firm, signed a $40 million agreement to install its restaurant-management software system in all new International House of Pancakes restaurants and some existing franchise locations. The five-year deal for the Restaurant Enterprise System includes hardware, software, support and system maintenance. IHOP has more than 1,000 restaurants in the United States and Canada. System installation in new IHOP restaurants began in late February, Micros said.

* Halifax, an Alexandria information technology firm, said it earned $115,000 (5 cents per share) in the quarter ended March 31. During the year-earlier period, the firm lost $2 million ($1.04). The company's fourth-quarter revenue rose to $13.7 million from $11.7 million. For the year, Halifax earned $302,000 (14 cents) on revenue of $49.4 million. Shares of Halifax closed at $3.60, down 5 cents.

* Deltek Systems of Herndon said it agreed to settle a lawsuit that shareholder Carl Brown brought against the company and its board over the company's decision to go private. Financial terms of the settlement were not disclosed. Deltek said in a statement that it committed no "violations of law or breaches of duty" but agreed to the settlement to avoid further litigation and to facilitate the transaction. The special shareholders meeting to vote on the deal is be held as scheduled tomorrow.

* InterImage, an Arlington company that provides database software and services, said it was awarded a contract with Overseas Private Investment Corp. worth more than $750,000. Under the contract, InterImage will implement systems and provide project support.

* Teligent, a Herndon telecommunications company that has filed for Chapter 11 reorganization, will appear in Manhattan bankruptcy court July 9, the earliest dale it could emerge from bankruptcy, according to a company source. If its plan is confirmed. Teligent will sell wholesale broadband services to business customers through its fixed wireless network as well as long-distance services to its 7,000 customers. Under the plan, Teligent's secured lenders will fund the new company. and its hank creditors -- Icd hy Chase Manhattan Bank -- will own stock in the successor company. Its unsecured hondholdcrs may recover a nominal amount of money, hut its equity holders aren't likely Io recover anything, the source said.

Compiled from reports by Washington Post staff writers. Washtech.com and Dow Jones News Service

INDEX REFERENCES -

COMPANY (TICKER) Micros Systems Inc.; Dcltek Systems Inc. (MCRS DLTK)

NEWS SUBJECT: Washington Post; Business Stories; Corporate/Industrial News; English language content; Dow Jones Total Market Index; Lawsuits; General News; Legal/Judicial (WP BZZ CCAT ENGL. WEI LWS GEN ('12)

MARKET SECTOR: Technology (TEC)

INDUSTRY: *Computer Makers*; Islamic Index: Software; Telecommunications, All (CPM XISL SOF TEL)

PRODUCT: Computer Hardware; Computer Software (DCO DCS)

REGION: United States; United States; North American Countries, North America (US USA NAMZNME)

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Schedule 6

National Cable Telecommunications Association Industry Statistics

Basic Cable Households (July. 2002)[1]	73,559.550
Digital Cable Subscribers (June 30,2002)'	16,800,000
Cable Modern Subscribers (June 30.2002)'	9.200,000
Homes Passed by Cable Modem Service (June 30, 2002)[5]	75,000,000
Cable-Delivered Residential Telephone Subscribers (June 30, 2002)[5]	2,100,000

Schedule 7

Jupiter/NPD Consumer *Survey*
General Outline Population

	General online population	
	Count	Col %
Base: all		
Q10. How do you connect to the Internet from home? (Select one)		
Dial-up modem (i.e uses your telephone line and requires dialing for connection)	1,579	78 40%
Cable modem (i.e. uses your cable TV connection)	168	8 40%
Digital Subscriber Line (DSL or ADSL) (i.e. a special high-speed connection that uses a phone line but does not require dialing for connection)	89	4 40%
I am not sure what type of connection I have	29	1.40%
Other (e g ISDN, T1/T3, WebTV) (Specify)	48	2 40%
I do not have access to the Internet from home.	101	5 00%
Total	2.014	100 00%
Base: respondents silh an Internet connection at home (Q10)		
Q11. Which of the following l y p s of companies currently provide your Internet service at home? (Select all that apply)		
America Online	142	38.80%
MSN	239	12.50%
Earthlink/Mindspring	I63	8.50%
Local telephone company (e g. Verizon, Pacific Bell, BellSouth)	163	8 50%
Free Internet service provider (e g Juno/NetZero)	115	6 00%
AT&T Worldnet	Y3	4.808
CompuServe	84	4 40%
My employer	84	4.401
Roadrunner	59	3.10%
Prodigy	44	2.30%
Other paid Internet service provider	318	16.60%
Some other type of company provides my home Internet service	112	5 80%
Don't know the type of company who provides m y home Internet service	33	1.70%
Total	1.913	100.00%

Jupiter/NPD Consumer Survey
General Outline Population

	General online population	
	Count	Col %
Base: respondents with an Internet connection at home (Q10)		
Q14. What are the most important advantages of using your current Internet service provider? (Select up to three responses)		
Local phone number for access	1,030	53 80%
Ease of establishing connection	549	28 70%
Lowest price	535	27 90%
Access provider doesn't drop my connection when I'm online	335	17 50%
Speed of data transfer (e.g. of downloading pages, surfing the web)	316	16 50%
Quality of technical support	307	16 10%
Ease of configuring to my computer	235	1230%
Ease of use when I'm traveling	175	Y 10%
Ability to control what my children are viewing on the Internet	153	8 00%
Convenience of receiving billing statement bundled with my telephone or cable bill	146	7 60%
Cost savings from ordering my online access through my current phone or cable provider	135	J 00%
Ability to filter e-mail to prevent unwanted advertising	96	5 00%
Cash rebates available in exchange for a multi-year commitment	67	3 50%
Internet information or services I can't get from another access provider	66	3 50%
Improved performance for online games via PC or console	35	180%
Newsgroup support	27	1.40%
Program reward points for usage (such as frequent flier miles)	7	0 40%
Some other factor not listed above	344	1800%
Total	1,913	100 00%
Base: all		
Q17. Which of the following features of "broadband" Internet service are the most appealing to you? (Please select up to 3 responses)		
Downloading a web page instantaneously	1,074	53.30%
Having your computer always connected to the Internet	967	48.00%
Downloading large files (such as MP3, music, video, software) faster	891	44.30%
Viewing quality video through the Internet	411	20.40%
Sharing an Internet connection between several computers and devices in your home without loss of speed	305	15.10%
Listening to quality audio through the Internet	291	14.40%
Playing high-quality, multiplayer games through the Internet	161	8.00%
Renting applications like tax software, games, etc. instead of buying them	103	5.10%
Other features not listed here appeal to me	119	5.90%
None of the features of broadband Internet service appeal to me	353	17.50%
Total	2,014	100.00%

Source: Jupiter/NPD Customer Survey (12101). n = 2,014 (US Only)

Jupiter/NPD Consumer Survey
Population Breakdown

	General online population		Gender				Age									
			Male		Female		18-24		25-34		35-44		45-54		55+	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: all																
Q10. How do you connect to the Internet from home? (Select one)																
Dial-up modem (i.e. uses your telephone line and requires dialing for connection	1,579	78.40%	717	76.60%	862	80.00%	271	74.70%	382	78.50%	396	80.50%	342	78.80%	187	78.80%
Cable modem (i.e. uses your cable TV connection)	168	8.40%	85	9.10%	83	7.70%	34	9.40%	46	9.40%	34	7.00%	36	8.30%	18	7.50%
Digital Subscriber Line (DSL or ADSL) (i.e. a special high speed connection that uses a phone line but does not require dialing for connection	89	4.40%	52	5.50%	37	3.40%	25	7.00%	16	3.30%	18	3.70%	18	4.10%	12	4.90%
I am not sure what type of connection I have	39	1.40%	11	1.20%	18	1.60%	8	2.20%	2	0.50%	8	1.60%	5	1.20%	5	2.00%
Other (e.g. ISDN, T1/T3, WebTV - Specify)	48	2.40%	27	2.90%	21	2.00%	10	2.70%	4	0.90%	14	2.80%	10	2.20%	11	4.60%
I do not have access to the Internet from home	101	5.00%	45	4.80%	56	5.20%	14	3.90%	36	7.50%	22	4.40%	23	5.40%	5	2.20%
Total	2,014	100.00%	937	100.00%	1,077	100.00%	363	100.00%	487	100.00%	492	100.00%	434	100.00%	238	100.00%
Base: respondents with an Internet connection at home (Q10)																
Q11. Which of the following types of companies currently provide your Internet service at home? (Select all that apply)																
America Online	742	38.80%	298	33.40%	444	43.40%	134	38.40%	194	43.10%	180	38.20%	161	39.30%	72	31.10%
MSN	219	12.50%	126	14.20%	113	11.00%	40	11.40%	52	11.50%	65	13.80%	46	11.30%	36	15.40%
Earthlink/Mindspring	163	8.50%	91	10.30%	71	7.00%	26	7.60%	41	9.10%	36	7.70%	41	9.90%	18	7.90%
Local telephone company (e.g. Verizon, Pacific Bell, BellSouth	165	8.50%	92	10.30%	71	6.90%	26	7.50%	28	6.20%	46	9.70%	40	9.70%	23	10.00%
Free Internet service provider (e.g. Juno/NetZero)	115	6.00%	62	7.00%	53	5.20%	22	6.20%	34	7.40%	20	4.30%	26	6.30%	14	6.00%
AT&T WorldNet	93	4.80%	57	6.30%	36	3.50%	13	3.70%	21	4.60%	16	3.30%	28	6.90%	15	6.60%
CompuServe	84	4.40%	44	5.00%	40	3.90%	18	5.20%	14	3.10%	21	4.40%	21	5.00%	11	4.60%
My employer	84	4.40%	35	4.00%	49	4.80%	23	6.70%	22	4.90%	22	4.70%	9	2.30%	7	3.20%
Roadrunner	59	3.10%	32	3.50%	27	2.70%	11	3.30%	13	2.90%	12	2.50%	16	3.90%	7	2.90%
Prodigy	44	2.30%	27	3.00%	17	1.60%	14	3.90%	7	1.70%	10	2.00%	10	2.50%	3	1.10%
Other paid Internet service provider	318	16.60%	161	18.10%	157	15.40%	52	14.90%	49	11.00%	90	19.20%	79	19.20%	48	20.40%
Some other type of company provides my home Internet service	112	5.80%	22	2.50%	46	4.50%	21	6.10%	12	2.70%	13	2.80%	17	4.00%	5	2.00%
Don't know the type of company who provides my home Internet service	33	1.70%	8	0.90%	24	2.40%	9	2.50%	8	1.70%	8	1.60%	4	1.00%	5	2.00%
Total	1,913	100.00%	892	100.00%	1,021	100.00%	349	100.00%	450	100.00%	471	100.00%	411	100.00%	233	100.00%

Jupiter/NPD Consumer Survey
Population Breakdown

	General online population		Online Tenure								Connection Speed			
			less than 1 yr		1 to less than 2 yrs		2 to less than 5yrs		5 yrs or more		Dial-up		Broadband (cable modem or DSL)	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: all														
Q10. How do you connect to the Internet from home? (Select one)														
Dial-up modem (i.e. uses your telephone line and requires dialing for connection)	1,579	78.40%	277	80.90%	384	82.90%	441	80.70%	477	72.40%	579	100.00%	0	0.00%
Cable modem (i.e. uses your cable TV connection)	168	8.40%	24	6.90%	27	5.80%	40	7.20%	78	11.80%	0	0.00%	168	65.50%
Digital Subscriber Line (DSL or ADSL) (i.e. a special high-speed connection that uses a phone line but does not require dialing for connection)	89	4.40%	11	3.30%	12	2.50%	20	3.70%	46	6.90%	0	0.00%	89	34.50%
I am not sure what type of connection I have	29	1.40%	6	1.90%	12	2.50%	8	1.50%	2	0.30%	0	0.00%	0	0.00%
Other (e.g. ISDN, T1/T3, WebTV) - Specify	48	2.40%	9	2.60%	4	0.90%	12	2.20%	24	3.60%	0	0.00%	0	0.00%
I do not have access to the Internet from home	101	5.00%	15	4.50%	25	5.40%	29	5.20%	32	4.90%	0	0.00%	0	0.00%
Total	2,014	100.00%	342	100.00%	463	100.00%	550	100.00%	659	100.00%	579	100.00%	257	100.00%
Base: respondents with an Internet connection at home (Q10)														
Q11. Which of the following types of companies currently provide your Internet service at home? (Select all that apply)														
America Online	742	38.80%	129	39.30%	200	45.80%	202	38.70%	211	33.70%	690	43.70%	40	15.60%
MSN	239	12.50%	78	23.80%	58	13.20%	47	9.00%	56	9.00%	189	11.90%	21	8.10%
Earthlink Mindspring	163	8.50%	15	4.50%	30	6.80%	47	9.10%	71	11.40%	146	9.30%	9	3.60%
Local telephone company (e.g. Verizon, Pacific Bell, BellSouth	163	8.50%	19	5.80%	37	8.50%	43	8.20%	64	10.30%	107	6.80%	50	19.40%
Free Internet service provider (e.g. Juno, NetZero)	115	6.00%	19	5.80%	29	6.50%	34	6.60%	33	5.30%	109	6.90%	4	1.60%
AT&T Worldnet	93	4.80%	10	3.10%	18	4.10%	30	5.80%	34	5.50%	69	4.40%	22	8.40%
CompuServe	84	4.40%	11	3.30%	26	6.00%	30	5.80%	17	2.70%	81	5.10%	1	0.50%
My employer	84	4.40%	8	2.50%	11	2.60%	20	3.80%	45	7.20%	69	4.30%	9	3.50%
Excite@Home	59	3.10%	9	2.90%	13	2.70%	11	2.00%	27	4.30%	2	0.10%	55	21.50%
Prodigy	44	2.30%	7	2.20%	7	1.50%	16	3.00%	14	2.30%	39	2.40%	3	1.30%
Other paid Internet service provider	318	16.60%	41	12.40%	58	13.30%	94	18.10%	125	20.00%	259	16.40%	45	17.50%
Some other type of company provides my home Internet service	112	5.80%	9	2.80%	15	3.40%	19	3.60%	25	4.00%	48	3.10%	15	5.90%
Don't know the type of company who provides my home Internet service	33	1.70%	8	2.30%	14	3.20%	5	1.00%	6	0.90%	22	1.40%	4	1.60%
Total	1,913	100.00%	328	100.00%	438	100.00%	521	100.00%	626	100.00%	579	100.00%	257	100.00%

Jupiter/NPD Consumer Survey
Population Breakdown

	population		less than $35K		$35K to less than $45K		$45K to less than $60K		$60K to less than $75K		$75K to less than 100K		100K or more	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: ...														
Q10. How do you connect to the Internet from home? (Select one)														
Dialup modem - I have a standard telephone line and it requires dialing for connection	1,579	78.10%	443	81.70%	195	82.60%	318	83.70%	253	72.90%	205	73.10%	184	72.30%
Cable modem - I have a coaxial cable TV connection	168	8.40%	37	6.90%	14	6.00%	22	5.70%	37	11.50%	27	9.80%	31	12.10%
Digital Subscriber Line (DSL or xDSL) - I have a special high-speed connection that uses a phone line but does not require dialing for connection	89	4.40%	13	2.40%	7	2.90%	7	1.80%	21	6.70%	23	8.30%	17	6.80%
Satellite - I have a satellite dish	29	1.40%	13	2.40%	2	0.70%	4	0.90%	8	2.60%	2	0.70%	1	0.50%
Other (e.g. ISDN, T1/T3, WebTV) - Specify	48	2.40%	18	3.30%	7	3.00%	9	2.30%	5	1.60%	4	1.30%	6	2.20%
I do not have access to the Internet from home	101	5.00%	18	3.30%	12	5.20%	21	5.60%	15	4.70%	19	6.80%	16	6.10%
Total	2,014	100.00%	543	100.00%	237	100.00%	380	100.00%	320	100.00%	281	100.00%	255	100.00%
Base: respondents with an Internet connection at home (Q10)														
Q11. Which of the following types of companies currently provide you ... service at home? (Select all that apply)														
America Online	742	38.80%	191	36.40%	105	46.90%	149	41.40%	121	39.70%	88	33.50%	88	36.90%
MSN	239	12.50%	81	15.30%	22	10.00%	45	12.60%	27	8.70%	39	15.00%	25	10.40%
EarthLink/Mindspring	163	8.50%	42	7.90%	20	8.80%	29	8.10%	25	8.10%	21	8.00%	27	11.40%
Local telephone company - e.g. Verizon, Pacific Bell, BellSouth	163	8.50%	39	7.40%	19	8.30%	30	8.50%	28	9.20%	20	7.60%	27	11.30%
Free Internet service provider e.g. Juno/NetZero	115	6.00%	38	7.30%	16	7.30%	22	6.40%	12	3.90%	17	6.50%	9	3.60%
AT&T WorldNet	93	4.80%	18	3.40%	7	3.50%	16	4.40%	18	5.80%	17	6.60%	17	6.90%
CompuServe	84	4.40%	23	4.50%	10	4.30%	22	6.20%	5	1.70%	15	5.80%	9	3.60%
My employer	84	4.40%	20	3.80%	8	3.60%	9	2.40%	11	3.50%	16	6.20%	21	8.70%
Broadcast.net	59	3.10%	10	1.90%	4	2.00%	9	2.60%	13	4.20%	10	3.90%	12	4.90%
Prodigy	44	2.30%	6	1.20%	4	1.70%	13	3.50%	9	3.00%	6	2.40%	5	2.20%
Other paid Internet service provider	318	16.60%	100	19.10%	31	14.00%	62	17.30%	57	18.70%	31	12.00%	36	15.20%
Some other type of company provides my home Internet service	112	5.80%	21	4.10%	8	3.50%	7	2.00%	11	3.80%	9	3.50%	11	4.50%
Don't know the type of company who provides my home Internet service	35	1.70%	10	1.90%	3	1.10%	5	1.40%	5	1.50%	8	3.00%	2	1.00%
Total	1,913	100.00%	525	100.00%	224	100.00%	358	100.00%	305	100.00%	262	100.00%	239	100.00%

Jupiter/NPD Consumer Survey
Population Breakdown

	General online population		Gender				Age									
			Male		Female		18-24		25-34		35-44		45-54		55+	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: respondents with an Internet connection at home (Q10)																
Q14. What are the most important advantages of using your current Internet service provider? (Select up to three responses)																
Local phone number for access	1,030	53.80%	497	55.70%	533	52.20%	158	45.20%	232	51.50%	274	58.30%	231	56.30%	124	57.80%
Ease of establishing connection	549	28.70%	245	27.40%	305	29.80%	72	20.70%	131	29.10%	129	27.40%	132	32.10%	85	36.60%
Lowest price	535	27.90%	247	27.70%	288	28.20%	121	34.60%	126	27.90%	115	24.50%	107	26.10%	66	28.40%
Access provider doesn't drop me or disconnect when I'm online	335	17.50%	168	18.80%	167	16.30%	58	16.50%	98	20.80%	70	14.90%	76	18.50%	37	16.10%
Speed of data transfer (e.g. of downloading pages surfing the web	316	16.50%	155	17.40%	160	15.70%	77	22.00%	67	14.80%	74	15.70%	61	14.70%	38	16.30%
Quality of technical support	307	16.10%	153	17.20%	154	15.10%	27	7.80%	62	13.80%	80	16.90%	82	19.90%	57	24.30%
Ease of configuring to my computer	235	12.30%	110	12.40%	125	12.20%	33	9.50%	60	13.30%	60	12.70%	52	12.70%	31	13.20%
Ease of use when I'm traveling	175	9.10%	78	8.80%	97	9.50%	28	8.10%	54	11.90%	41	8.80%	32	7.80%	19	8.30%
Ability to control what my children are viewing on the Internet	153	8.00%	45	5.10%	107	10.50%	14	4.00%	52	11.50%	59	12.60%	27	6.70%	0	0.00%
Convenience of receiving billing statement bundled with my telephone or cable bill	146	7.60%	65	7.30%	81	7.90%	23	6.60%	31	6.80%	48	10.10%	31	7.50%	14	6.00%
Cost savings from ordering my online access through my current phone or cable provider	135	7.00%	65	7.30%	69	6.80%	23	6.50%	23	5.00%	35	7.40%	35	8.60%	19	8.20%
Ability to filter e-mail to prevent unwanted advertising	96	5.00%	31	3.50%	65	6.30%	17	4.90%	24	5.40%	26	5.60%	18	4.30%	10	4.50%
Cash rebates available in exchange for a multi-year commitment	67	3.50%	36	4.10%	31	3.00%	14	4.10%	11	2.50%	18	3.90%	16	3.90%	7	3.00%
Internet information or services I can't get from another access provider	66	3.50%	24	2.70%	42	4.10%	23	6.70%	10	2.20%	14	3.00%	9	2.30%	9	4.00%
Improved performance for online games via PC or console	35	1.80%	21	2.40%	14	1.40%	12	3.50%	11	2.40%	4	0.90%	4	1.00%	3	1.50%
Newsgroup support	27	1.40%	20	2.30%	7	0.70%	8	2.30%	4	0.90%	7	1.40%	5	1.20%	4	1.70%
Program reward points for usage (such as frequent flier miles)	7	0.40%	3	0.30%	5	0.40%	0	0.00%	3	0.60%	2	0.50%	1	0.20%	1	0.50%
Some other factor not listed above	344	18.00%	158	17.70%	186	18.20%	91	26.00%	76	16.80%	75	15.90%	72	17.60%	31	13.10%
Total	1,913	100.00%	892	100.00%	1,021	100.00%	349	100.00%	450	100.00%	471	100.00%	411	100.00%	233	100.00%
Base: all																
Q17. Which of the following features of "broadband" Internet service are the most appealing to you? (Please select up to 3 responses)																
Downloading a web page instantaneously	1,074	53.30%	521	55.70%	553	51.30%	202	55.70%	294	60.50%	260	52.70%	223	51.30%	95	40.10%
Having your computer always connected to the Internet	967	48.00%	448	47.80%	519	48.20%	182	50.10%	239	49.00%	219	44.50%	210	48.30%	117	49.30%
Downloading large files (such as MP3, music, video, software) faster	891	44.30%	443	47.30%	448	41.60%	201	55.40%	260	53.50%	200	40.70%	152	35.10%	77	32.20%
Viewing quality video through the Internet	411	20.40%	259	27.60%	152	14.10%	71	19.40%	121	24.80%	106	21.50%	78	17.90%	36	15.10%
Sharing an Internet connection between several computers and devices in your home without loss of speed	305	15.10%	154	16.50%	150	14.00%	59	16.10%	68	13.90%	76	15.50%	72	16.50%	31	13.00%
Listening to quality audio through the Internet	291	14.40%	141	15.00%	150	14.00%	92	25.30%	72	14.80%	65	13.20%	49	11.30%	13	5.40%
Playing high-quality, multiplayer games through the Internet	161	8.00%	82	8.80%	79	7.30%	50	13.70%	41	8.40%	39	7.90%	24	5.60%	7	2.80%
Renting applications like tax software, games, etc. instead of buying them	103	5.10%	29	3.10%	74	6.90%	14	3.90%	32	6.60%	24	4.90%	25	5.70%	8	3.30%
Other features not listed here appeal to me	119	5.90%	60	6.40%	59	5.50%	25	7.00%	22	4.60%	30	6.10%	25	5.70%	17	7.00%
None of the features of broadband Internet service appeal to me	353	17.50%	132	14.10%	221	20.50%	39	10.80%	50	10.40%	98	20.00%	95	21.90%	70	29.20%
Total	2,014	100.00%	937	100.00%	1,077	100.00%	363	100.00%	487	100.00%	492	100.00%	434	100.00%	238	100.00%

Source: Jupiter/NPD Customer Survey (12/01), n = 2,014 (US Only)

Jupiter/NPD Consumer Survey
Population Breakdown

	General online population		Online Tenure								Connection Speed			
			less than 1 yr		1 to less than 2 yrs		2 to less than 5yrs		5 yrs or more		Dial-up		Broadband (cable modem or DSL)	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: respondents with an Internet connection at home (Q10)														
Q14. What are the most important advantages of using your current Internet service provider? (Select up to three responses)														
Local phone number for access	1,030	53.80%	173	52.90%	243	55.50%	285	54.70%	328	52.40%	976	61.80%	19	7.50%
Ease of establishing connection	549	28.70%	75	22.80%	118	27.00%	157	30.20%	199	31.80%	392	24.80%	133	51.80%
Lowest price	535	27.90%	94	28.80%	111	25.40%	143	27.50%	186	29.70%	481	30.50%	29	11.10%
Access provider doesn't drop my connection when I'm online	335	17.50%	34	10.30%	60	13.70%	104	19.90%	137	21.90%	238	15.10%	87	33.80%
Speed of data transfer (e.g. of downloading pages, surfing the web)	316	16.50%	42	13.10%	54	12.20%	88	16.90%	131	20.90%	123	7.80%	177	68.90%
Quality of technical support	302	16.10%	72	15.80%	93	21.20%	72	13.90%	90	14.40%	253	16.00%	39	15.00%
Ease of configuring to my computer	235	12.30%	36	11.10%	60	13.80%	63	12.10%	76	12.10%	220	13.90%	13	5.20%
Ease of use when I'm traveling	175	9.10%	6	1.80%	26	5.90%	54	10.30%	89	14.20%	161	10.20%	11	4.40%
Ability to control what my children are viewing on the Internet	153	8.00%	34	10.40%	54	12.40%	43	8.20%	21	3.40%	142	9.00%	7	2.60%
Convenience of receiving billing statement bundled with my telephone or cable bill	146	7.60%	33	10.10%	30	6.90%	39	7.50%	44	7.00%	95	6.00%	47	18.40%
Cost savings from ordering my online access through my current phone or cable provider	135	7.00%	21	6.50%	33	7.60%	42	8.00%	38	6.10%	100	6.30%	32	12.50%
Ability to filter e-mail to prevent unwanted advertising	96	5.00%	11	3.50%	31	7.10%	24	4.50%	29	4.70%	90	5.70%	5	2.00%
Cash rebates available in exchange for a small(er) commitment	67	3.50%	14	4.20%	15	3.50%	24	4.60%	14	2.20%	65	4.10%	2	0.60%
Internet information or services I can't get from another access provider	66	3.50%	8	2.50%	14	3.20%	21	4.10%	23	3.70%	56	3.60%	8	3.10%
Improved performance for online games via PC or console	35	1.80%	4	1.20%	2	0.50%	13	2.60%	15	2.50%	10	0.60%	24	9.50%
Newsgroup support	27	1.40%	3	0.80%	8	1.90%	2	0.50%	14	2.20%	22	1.40%	4	1.70%
Program reward points for usage (such as frequent flier miles)	7	0.40%	2	0.60%	2	0.40%	1	0.20%	2	0.40%	7	0.40%	0	0.20%
Some other factor not listed above	344	18.00%	79	24.10%	74	16.80%	90	17.40%	101	16.10%	294	18.60%	29	11.30%
Base: all														
Q17. Which of the following features of "broadband" Internet service are the most appealing to you? (Please select up to 3 responses)														
Downloading a web page instantaneously	1,074	53.30%	161	47.10%	216	46.60%	291	52.90%	407	61.70%	855	54.20%	146	56.90%
Having your computer always connected to the Internet	967	48.00%	143	41.80%	207	44.60%	279	50.70%	338	51.30%	755	47.80%	149	57.80%
Downloading large files (such as MP3, music video, software) faster	891	44.30%	137	40.10%	170	36.70%	225	40.90%	359	54.50%	679	43.00%	151	58.90%
Viewing quality video through the Internet	411	20.40%	65	19.10%	106	22.90%	112	20.40%	127	19.30%	322	20.40%	49	19.20%
Sharing an Internet connection between several computers and devices in your home without loss of speed	305	15.10%	38	11.10%	35	7.50%	79	14.30%	153	23.30%	232	14.70%	61	23.90%
Listening to quality audio through the Internet	291	14.40%	75	22.00%	69	14.90%	78	14.10%	69	10.50%	217	13.70%	46	17.90%
Playing high-quality, multiplayer games through the Internet	161	8.00%	38	11.00%	38	8.20%	42	7.70%	44	6.60%	114	7.20%	28	10.90%
Renting applications like tax software, games, etc. instead of buying them	103	5.10%	14	4.00%	36	7.80%	26	4.70%	28	4.20%	87	5.50%	6	2.30%
Other features not listed here appeal to me	119	5.90%	20	5.90%	18	3.90%	36	6.50%	45	6.80%	88	5.60%	19	7.30%
None of the features of broadband Internet service appeal to me	353	17.50%	75	22.00%	105	22.80%	97	17.60%	75	11.40%	279	17.70%	19	7.30%

Jupiter/NPD Consumer Survey
Population Breakdown

	General online population		Household Income									
			less than $35K		$35K to less than $45K		$45K to less than $60K		$60K to less than $75K		$75K to less than 100K		100K or more	
	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %	Count	Col %
Base: respondents with an Internet connection at home (Q10)														
Q14. What are the most important advantages of using your current Internet service provider? (Select up to three responses)														
Local phone number for access	1,030	52.80%	[illegible]	[illegible]	[illegible]	[illegible]	200	55.80%	156	51.30%	125	47.80%	112	46.90%
Ease of establishing connection	549	28.70%	[illegible]	[illegible]	[illegible]	[illegible]	101	28.10%	85	27.80%	72	27.40%	78	32.50%
Lowest price	535	27.90%	[illegible]	[illegible]	[illegible]	[illegible]	106	29.50%	78	25.40%	73	28.00%	53	22.40%
Your provider does not drop my connection when I am online	335	17.50%	[illegible]	[illegible]	[illegible]	[illegible]	62	17.20%	65	21.30%	39	14.90%	53	22.10%
Speed of data transfer (e.g., of downloading pages while using the web)	316	16.50%	[illegible]	[illegible]	[illegible]	[illegible]	43	11.90%	51	16.80%	53	20.40%	68	28.30%
Quality of technical support	307	16.10%	[illegible]	[illegible]	[illegible]	[illegible]	69	19.40%	54	17.60%	52	19.80%	21	8.60%
Ease of configuring to my computer	235	12.20%	[illegible]	[illegible]	[illegible]	[illegible]	42	11.60%	45	14.90%	41	15.70%	29	12.00%
Ease of use when I'm traveling	175	9.10%	[illegible]	[illegible]	[illegible]	[illegible]	35	9.90%	26	8.50%	20	7.60%	32	13.60%
Ability to control what my children are viewing on the Internet	153	8.00%	[illegible]	[illegible]	[illegible]	[illegible]	40	11.70%	21	7.00%	19	7.30%	9	3.80%
Convenience of one billing statement (bundled service via telephone or cable bill)	146	7.60%	[illegible]	[illegible]	[illegible]	[illegible]	26	7.20%	20	6.70%	19	7.40%	18	7.70%
Cost savings from ordering my online access through my current phone or cable provider	135	7.00%	[illegible]	[illegible]	[illegible]	[illegible]	35	9.20%	24	7.90%	16	6.20%	21	8.60%
Ability to filter e-mail to prevent unwanted advertising	98	5.10%	[illegible]	[illegible]	[illegible]	[illegible]	16	4.60%	13	4.20%	11	4.30%	14	5.70%
Dedicated line available in exchange for a multi-year commitment	67	3.50%	[illegible]	[illegible]	[illegible]	[illegible]	14	4.00%	5	1.70%	14	5.50%	7	2.80%
Another Internet service I can't get from another service provider	66	3.50%	[illegible]	[illegible]	[illegible]	[illegible]	13	3.80%	15	5.30%	10	3.90%	10	4.30%
Improved performance for online games via PC or console	35	1.80%	[illegible]	[illegible]	[illegible]	[illegible]	4	1.20%	8	2.60%	4	1.50%	6	2.50%
Other	27	1.40%	[illegible]	[illegible]	[illegible]	[illegible]	9	2.50%	3	0.90%	2	0.60%	4	1.60%
Frequent reward points for usage such as frequent flier miles	7	0.40%	[illegible]	[illegible]	[illegible]	[illegible]	2	0.60%	1	0.20%	0	0.00%	2	1.00%
None of the factors listed above	344	18.50%	[illegible]	[illegible]	[illegible]	[illegible]	58	16.10%	45	14.70%	57	21.80%	48	20.20%
Total	1,915	100.00%	[illegible]	[illegible]	[illegible]	[illegible]	358	100.00%	305	100.00%	262	100.00%	239	100.00%
Base: all														
Q15. Which of the following features of "broadband" Internet service are the most appealing to you? (Please select up to 3 responses)														
Downloading a web page instantaneously	1,074	53.30%	282	51.90%	126	53.30%	203	53.60%	168	52.50%	154	54.90%	141	55.40%
Having your computer always connected to the Internet	967	48.00%	249	45.70%	119	50.10%	173	45.70%	162	50.80%	141	50.00%	124	48.70%
Downloading large files such as MP3, music, video, software faster	891	44.30%	238	43.90%	117	49.40%	147	38.80%	152	47.60%	120	42.60%	117	45.90%
Viewing quality video through the Internet	411	20.40%	115	21.20%	48	20.20%	79	20.70%	62	19.40%	54	19.40%	53	20.80%
Sharing an Internet connection between several computers and devices in your house without loss of speed	305	15.10%	67	12.40%	22	9.30%	51	13.30%	47	14.70%	56	20.10%	61	24.10%
Listening to quality audio through the Internet	291	14.40%	81	15.00%	46	19.50%	45	11.80%	52	16.20%	43	15.10%	25	9.90%
Playing high-quality, multiplayer games through the Internet	161	8.00%	53	9.70%	22	9.40%	28	7.40%	25	7.80%	22	7.70%	11	4.30%
Renting applications like tax software, games, etc., instead of buying them	103	5.10%	28	5.10%	15	6.40%	22	5.90%	15	4.80%	5	1.80%	18	6.90%
Other features not listed here appeal to me	119	5.90%	37	6.70%	18	7.60%	13	3.50%	13	4.20%	18	6.60%	20	7.70%
None of the features of broadband Internet service appeal to me	353	17.50%	102	18.70%	36	15.20%	81	21.30%	52	16.30%	48	17.00%	34	13.30%
Total	2,014	100.00%	543	100.00%	237	100.00%	380	100.00%	320	100.00%	281	100.00%	255	100.00%

Source: Jupiter/NPD Customer Survey (12/01), n = 2,014 (US Only)

III. Market Concentrations under the Horizontal Merger Guidelines

76. In the conduct of its enforcement responsibilities in connection with mergers, the US Department of Justice and the Federal Trade Commission rely on the ***Horizontal Merger Guidelines*** to provide businesses and consumers with a clear articulation of the methods and standards that the agencies employ to evaluate the competitive effects of transactions.[35]

77. The ***Horizontal Merger*** *Guidelines* provide an economic framework that is particularly useful for the examination of competitive issues relating to the definition of relevant geographic and product markets. In this proceeding, Terry L. Murray, another witness for Covad, has already made use of the *Guidelines* to assess particular issues relating to certain unbundled network elements (UNEs) that are under review by the Commission in this proceeding.

78. Under the ***Guidelines,*** market participants are identified and attempts are made to assess the market "share" that can be assigned to each such participant. These measures of market share form the basis of calculations of market concentration under the Herfindahl-Hirshman Index ("HHI").

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[35] US Department of Justice and the Federal Trade Commission, *Horizontal* ***Merger*** *Guidelines,* issued April 2, 1992, revised April 8, 1997.

79. The HHI is calculated by "summing the squares of the individual market shares of all participants. Unlike the four-firm concentration ratio, the HHI reflects both the distribution of the market shares of the top four firms and the composition of the market outside the top four firms. It also gives proportionately greater weight to the market share of the larger firms, in accord with their relative importance in competitive interactions."[36]

80. Under the *Guidelines,* a market that was entirely controlled by a single firm would have an HHI of 10,000 (100 * 100). A market that was controlled by two firms, each of which held 50% of the market, would have an HHI of 5,000.[37] If the two firms had unequal market shares, the HHI would be higher than 5,000. For example, if a market were controlled by two firms, one of which held 70% of the market, while the second firm held 30%, the HHI would be 5,800. Thus, with only two firms, the HHI would necessarily be at least 5,000.

81. There is no doubt that a market with an HHI of 5,000 or more is a highly concentrated market under the *Guidelines*. The *Guidelines* state that if a market's Post-Merger HHI is above 1,800, the agency regards the market to be highly concentrated.[38] Mergers producing an increase in the HHI of more than 50 points in highly concentrated markets post-merger potentially raise "significant" competitive concerns...[39]

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[36] *Horizontal merger Guidelines,* Section 1.5.

[37] *(50* 50)* plus *(50 * 50)* = 2,500.

[38] *Horizontal Merger Guidelines,* Section I.51

[39] Id.

82. The most favorable possible way to apply the HHI analysis to the ILECs would be to assume that the market includes only broadband access to the Internet and includes both businesses and residences in one market. By using these assumptions, we discount entirely that the ILECs control over SO% of access to the Internet through dial-up. We also ignore the fact that cable is not meaningful competition when the customer is a small business. Yet even limiting the analysis in these ways, there is only one technology, cable modems, that provides any real (albeit limited) competition to the DSL services offered today. If there were no possibility of line sharing, there would be only one provider (the ILEC) of DSL services effectively constraining the price to such customers and one provider (the franchised cable operator) of cable modem services to at least some of the same customers. In other words, there would effectively be at most two providers of broadband services and its provision would be highly concentrated under the *Guidelines*.

83. One way to recognize the degree of market concentration that would exist for broadband Internet access absent line sharing is to view those services as if a merger between a single, successful, line-sharing CLEC and an ILEC was now being proposed.

84. Let us assume the following market shares in a "broadband Internet market": cable modem provider = 50%, ILEC = 30%, CLEC 20%. Even with CLEC competition, this market would still be highly concentrated with a pre-merger HHI of 3,800. Nevertheless, the proposed merger would increase the HHI from 3,800 to 5,000, a change of 1,200 points. The agencies would thus be confronted with a highly concentrated market,

post-merger, and a proposed increase in HHI that far exceeded the 50 point threshold. There is little doubt that the agencies would readily oppose such a transaction.

85. All else equal, market concentration affects the likelihood that one firm, or a small group of firms, can successfully exercise market power. Market power, to a seller, is the ability to profitably maintain prices above competitive levels. The result of an exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources. Sellers with market power also may lessen competition on dimensions other than price, such as product quality, service, or innovation.

86. As set forth earlier in this Declaration, it appears that, by any definition, the ILECs continue to possess market power. It also appears that the ILECs historically have chosen to exercise that market power through higher prices for DSL services and through delays in the introduction of innovative services including DSL itself in the mid-1990s and SDSL services. The behavior of the ILECs can readily be understood as an exercise of market power.

IV Intra-DSL Competition

A. The California Experience

87. As noted above, according to the FCC's most recent statistics, US cable modem penetration currently exceeds ADSL penetration among residential and small business customers by a factor of 1.8 to 1.0. However, in fact DSL penetration is even more significant in some areas of the country than others. In the state of California, for example, more subscribers are now served by DSL than by cable modem services. The California Public Utility Commission's ("CPUC") own statistics indicate that in California, there are 735,677 (ADSL lines (provided by both ILECs and CLECs) and 609,174 cable lines in service.[40] Furthermore, the Commission's more current Form 477 data indicate that, as of December 2001, there were 928,345 **ADSL** subscribers versus only 786,789 cable users in California. By these most recent figures, ADSL technology is now used to serve 45% of the broadband users in California, versus only 39% for cable modem.[41]

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[40] Letter to William Maher, Chief, Wireline Competition Bureau, Federal Communicalions Commission from Jason D. Oxman, Vice President and Assistant General Counsel, Covad Communications Company, October 1 I, 2002, **page** 2.

[41] Letter to Marlene Dortch, Secretary, Federal Communications Commission, from Praveen Goyal, Senior Counsel, Covnd Communications Company, November 15.2002, at Attachment 2. The remaining 16% **of** subscribers are served by "other" broadband services, which as described above include **types** of DSL other than ADSL.

88. **As** noted in other filings by the company, Covad launched its own competitive DSL service offerings in California earlier than in any other state. Covad's launch of DSL services was accompanied not by **a** decrease, but by an ***increase*** in DSL provisioning from the ILEC. Accordingly, the high DSL penetration in California reflects the results of a sustained competitive struggle between CLECs and the dominant ILEC of almost five year's duration. In this period, Covad and other CLEC's introduced ADSL pricing and service options to which the incumbent ILEC, Pacific Bell/SBC, sought to respond. **As** part of its response, in 1999, Pacific Bell announced that it would "nearly triple its current deployment and offer ADSL services in 255 wire centers that serve 70 percent of its customers. By the end of 1999, five million residential and 900,000 business customers will be ADSL-ready."[42] Thus, there is little doubt that in California at least, CLEC entry into DSL competition was met with major increases in DSL investments by the dominant ILEC.

89. In its own filing with the Commission, the California PUC has argued that "the fact that Pacific/SBC has successfully promoted DSL service to customers under the current regulatory environment to the point of outstripping cable modem service makes clear that the current regulatory environment is conducive to, and does not impede investment in broadband technology by the ILEC." [43]

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[42] Id. **page** 2.

[43] CA PUC Comments, page 8

B. Serving Wholesale Customers for DSL

90. In this case, Covad is seeking to preserve unbundled access to the high-frequency portion of ILEC loops in order to provide DSL services over shared lines. It is important to recognize however, that despite the fact that Covad's DSL services are provided over shared lines, the services offered by Covad are not identical to the DSL offerings that the ILECs make over their own lines. In particular, Covad's services to large wholesale customers such as ISPs differ in important respects from the wholesale DSL services now offered by the ILECs.

91. Covad is a national provider of DSL services. Unlike the RBOCs, Covad's services are not limited to specific geographic territories within the United States. For this reason, unlike the RBOCs, Covad can and does offer true nationwide services to potential wholesale DSL customers.

92. Covad's DSL network now offers the ability to reach 40 million end users nationwide through one, integrated OSS system. This feature alone is particularly important for nationwide residential ISPs such as AOL and Earthlink.

93. For large ISP customers, the ability to link their own OSS system to a single Covad OSS means that OSS functions such as customer pre-qualification, order entry, order status and others can be readily scaled up for large volumes of traffic. By contrast, national ISPs seeking to offer DSL services from the RBOCs are forced to link their OSS systems to multiple RBOC OSS systems with attendant incompatibilities in both function and process.

94. In addition to a single, nationwide OSS system, Covad also offers nationwide ISPs individually tailored integrated value-added services such as technical support for the entire Internet connection including the DSL loop, CPE and the ATM backbone. Covad now operates the second largest ATM backbone in the United States. By contrast, the ILECs only offer regional backbone services and have not deployed ATM switching capabilities on a nationwide basis.

95. Beyond these advantages, Covad also offers to its wholesale customers greater customer choice than the ILECs offer through different product pricing tiers, ADSL services on longer loops up to 18,000 feet where technically feasible, and alternatives to ADSL including IDSL and SDSL broadband options. All of these features and options serve to distinguish the DSL services of the ILECs from the DSL services offered by Covad and other CLECs. Absent intra-modal competition from the CLECs, there is no reason to expect that the ILECs would ever begin to offer these functional and service innovations to wholesale or retail customers.

V. Line Sharing and Future Investment Levels

96. As noted above, in California, ADSL line counts now exceed cable modem line counts. Importantly, Pacific Bell/SBC provides the vast majority of those ADSL lines to its own retail customers rather than to CLECs such as Covad. This growth in ADSL lines has occurred in response to or, from the ILEC point of view, despite, the early and effective implementation of DSL line sharing rules in California. For these reasons, the California experience provides real world evidence that current regulatory policies, including line sharing promote and do not impede investment in broadband technology by the ILECs. Moreover, the California experience demonstrates fundamentally that broadband DSL can and does compete decisively against inter-modal competitive technologies including cable modems.

97. Nevertheless, various ILEC witnesses in this proceeding have put forth both broad-based and more specific arguments that bear on the issue of ILEC incentives to invest in their own facilities if they must also unbundled the high-frequency portions of their loops. These broad-based arguments do not focus on line sharing *per se* but rather seek to undermine the broader policy of all UNE unbundling including line sharing. AT&T witnesses Robert Willig. William Lehr, John Bigelow and Stephen Levinson have termed this broad-based attack on unbundling as the

Investment Deterrence Hypothesis.[44] More specific attacks on the unbundling of ILEC copper loops appear in the Declarations of Howard A. Shelanski and of Alfred Kahn and Timothy Tardiff.

Investment Deterrence Hypothesis and Line *Sharing*

98. In this context, the *Investment Deterrence Hypothesis* argues essentially that the unbundling and/or sharing of ILEC facilities and the leasing of those facilities at TELRIC derived prices discourages new investment by the ILECs. Allegedly the ILEC incentive to invest is reduced because, with unbundling and/or line sharing, future ILEC investments will he less profitable than they would otherwise be.

99. At the outset, it must be recognized that the proponents of the *Investment Deterrence Hypothesis* remain silent with respect to the pre-1996 Act or pre-Line *Sharing Order status quo.* They offer no proof to support the counter-intuitive claim that somehow, absent competitive pressure, the incumbents will nonetheless cut prices and introduce new products and telecommunications services anywhere.

100. ILEC witnesses do not even attempt to defend the *status quo* because for numerous telecommunications services, including specifically Internet access, there is no real defense they could offer. Telecommunications markets are highly concentrated and both history and economic theory

[44] Robert Willig, William H. Lehr, John. B. Bigelow and Stephen B. Levinson, *Stimulating Investment und the Telecommunications Acr of 1996*, October 11, 2002, pages 1-2. (Hereinafter "Willig et. al.").

agree that such markets produce high prices, low output and a lack of innovation.

101. As noted earlier in this Declaration, absent line sharing, the provisioning of Internet access will remain highly concentrated. Absent line sharing, there is little reason to believe that future ILEC investment in DSL equipment would even remotely approach the investment levels that would be required if the ILECs were compelled to compete vigorously with CLECs for broadband services. Competition not only lowers prices, it enlarges markets and larger markets in turn require increased investment. If the Commission were to eliminate line sharing and maintain fully the market power of the ILECs, the inevitable results will include reduced output as well as higher prices. It is only the sub-optimal level of investment needed to serve this reduced output that would continue if the provisioning of these services remains as highly concentrated as it is today.

102. Furthermore, even assuming the counter-intuitive claim of the ILECs that, absent line sharing, they would dramatically increase their investments, their claim clearly makes little sense in the specific case of the shared, high frequency portion of existing loops. For existing loop facilities, there is no new or incremental investment to be discouraged. In existing ILEC loops, it is only the high frequency portion of the loop that now lies unused (and ready to be shared). The loop itself already both exists and generates substantial revenue for the ILEC.

103. Even in years past, when the existing voice grade loop was originally deployed, its deployment was not based on the future marginal

profitability of the high frequency portion of that loop. Rather the voice grade loop had to be deployed in response to the ILEC's common carrier responsibilities to provide telephone service within the boundaries of its protected service temtory.

104. The significance of the fact that voice grade loops are deployed by the ILECs in order to provide voice grade telephone services in ILEC service territories extends also to the new loops, both copper and fiber-fed, that the ILECs will deploy in the future. **As** new subdivisions are constructed in ILEC service territories, the ILECs will build new loops primarily to provide voice grade telephone services to these customers. The need to construct these facilities will be driven largely by the ILEC's common carrier requirements and not by the expected future value of the high frequency portion of those loops.[45]

105. Since new loop facilities will be constructed to meet new demands for voice grade telephone service, the ILECs' costs for these new loop facilities will almost certainly be recovered fully through the telephone rates that the ILECs will charge. Nevertheless, these new facilities will also include unused high frequency loop portions that can be dedicated to DSL services in the future. Thus, HFPL capacity for DSL will be both constructed and paid for as the ILEC adds new loops to meet new demands for voice grade telephone services in the future.

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[45] For example, Verizon has publicly stared that its tiber-fed loop deployment will be driven primarily **by** the need to improve its feeder plant to improve POTS **service** quality. ***See*** "Veriron PARTS **Workshop."** Presentation delivered February 26, 2001. at 11, available **at** http://www22.verizon.com/wholesale/clec/east/resources/0206workshop.ppt.)

106. Moreover, since the incremental cost of the high frequency portion of the loop ("HFPL") is costless, it would be extremely difficult to under-price the HFPL through allegedly misguided UNE pricing rules. Again, no investment in existing or new ILEC loop plant is likely to be deterred as a result of shared lines being priced below their minimal cost. For all of these reasons, line sharing with a CLEC does not discourage new investment by the ILEC in the high frequency portion of loops.

Specific Comments of ***ZLEC*** *witnesses Shelanski, Kahn and Tardiff*

107. With respect to the more specific attacks on unbundling of loop facilities, ILEC witness Shelanski does not even suggest that CLEC access to conventional voice loops could be accomplished in any manner other than through unbundling. He states, "The data also show that the case for impairment without unbundling access to conventional voice loops is diminishing..."[46] Dr. Shelanski also cites a 1999 FCC staff report to the effect that "The Commission has itself emphasized the importance of inter-modal competition on the ILEC's in the broadband context in finding that 'the ILEC's aggressive deployment of DSL **can** be attributed in large part to the deployment of cable modem service.'"[47]

108. Of course, as noted earlier in connection with the *EchoStar* Order, the Commission in 2002 explicitly recognized the many significant benefits that flow from intra-modal competition which are simply omitted in Dr.

[46] Declaration of Howard **A.** Shelanski, Par. 44.

[47] Declaration of Howard **A.** Shelanski, Par. **43.**

Shelanski's discussion. Moreover, as noted in the timeline presented at Schedule 3, ILEC entry into the provision of DSL services was clearly motivated by intra-modal competition from CLECs offering DSL services.

109. Drs. Kahn and Tardiff raise the most specific attacks on line sharing. They state that the ILECs "are not only in intense competition with many other companies offering high-speed access, most importantly to the Internet via cable, satellite and wireless transmission; they are markedly behind their main competitors, the cable companies."[48]

110. The viability of each of the broadband competitive alternatives discussed by Kahn and Tardiff have been addressed earlier in this report. With the limited exception of cable modems, none of these alternatives now provide viable competitive alternatives to DSL services for residential and small business customers. Moreover, while, the telephone companies may have lagged "behind' their main competitors in the past, our prior discussion makes clear that lack of competition and ILEC fears of legacy product cannibalization were the real reasons why ILEC deployment of DSL services faltered so dramatically in the mid-1990s.

111. Drs. Kahn and Tardiff also state that "The obligation to offer competitive access providers use of the high frequency portion of those lines –thereby excluding their own use of the lines for that purpose—clearly biases the economics of that decision, because, unlike providers of cable modems, the ILECs would be forced to share potential DSL volumes with CLECs,

[48] Declaration of Alfred Kahn and Timothy Tardiff, Par 38

who in turn would receive access to customers at very attractive prices (because of line sharing)[49] (Emphasis Added).

112. With respect to the claim that cable modem providers need not share "potential DSL volumes" with CLECs, it again should be emphasized that, for the many reasons noted earlier in this Declaration, cable modem service is itself different from and, in many ways, inferior to DSL services for broadband access. For this reason, the focus by Kahn and Tardiff, not on service features and prices, but on a single alleged difference in regulatory treatment is basically meaningless.

113. If one wishes to compare cable and telephone company regulation, why focus only on a single difference in the overall regulatory regimes that each firm faces? Cable TV providers face not only their own franchise regulations but also numerous issues attendant on the fact that, unlike ILECs, cable TV companies must purchase programming as well as equipment from unaffiliated suppliers. In addition, they face continuing regulatory restrictions as to certain programs to be carried. Even if one sought to compare cable and ILEC regulatory burdens and opportunities, that comparison is nowhere found in the Kahn/Tardiff Declaration.

114. **Also,** with respect to the Kahn and Tardiff claim of bias in favor of the CLECs, it is particularly interesting that Drs. Kahn and Tardiff omit any reference to the "very attractive prices" at which the ILECs themselves would receive access to customers for the provision of DSL services. The

[49] Declaration **of Alfred** Kahn **and** Timothy **Tardiff.** Par. 38

minimal costs associated with accessing the high frequency portion of the loop would of course be the same for the ILEC as well as the CLECs. If a retail customer chooses to purchase DSL services from the ILEC, either in the first instance, or in a win-back from the CLEC, the HFPL simply reverts to the ILEC. There is no bias either in pricing or in access to these underlying facilities. For these reasons, there is no bias as between CLECs and ILECs for the provision of shared loop facilities.

115. Finally, Kahn and Tardiff argue that since the ILECs do not now share all-fiber-loops with CLECs, at some future point that they may have to "unbundle the fiber as well – precisely the kind of extremely expensive risky new investment to which the logic of mandatory network element sharing is least applicable and most inhibiting of dynamic competition."[50] Although the focus of this declaration is the line sharing unbundled network element, several brief points seem in order to respond to ILEC claims regarding other UNEs, such as all-fiber loops.

116. What Kahn and Tardiff imply is that, because the retail revenue stream to the ILEC could be lower when it provides the loop at a wholesale UNE rate than when it uses the same loop for its retail service, the prospect of unbundling somehow diminishes the incentive of the ILEC to invest in that loop. In fact, the history of ILEC DSL deployment clearly suggests that it is the maintenance of a monopoly that disincents ILEC network investment. Kahn and Tardiff ignore the disincentives to ILEC investment fostered by loss of any revenue stream whatsoever for service over the

[50] Declaration of Alfred Kahn and Timothy Tardiff, Par. 38

loop – for example, if a customer switches to the network of a duplicate, alternative loop provider. Indeed, it appears clear that the only scenario in which the ILEC would face the least risk to its network investment is a scenario in which it remains the only available service provider. For the reasons already discussed, such a scenario can readily be dismissed as failing to produce the levels of innovation, price competition, demand stimulation and investment produced in a competitive market. The history of ILEC DSL deployment provides ready confirmation of this fact.

VI. Gains in Consumer Surplus from CLEC Entry

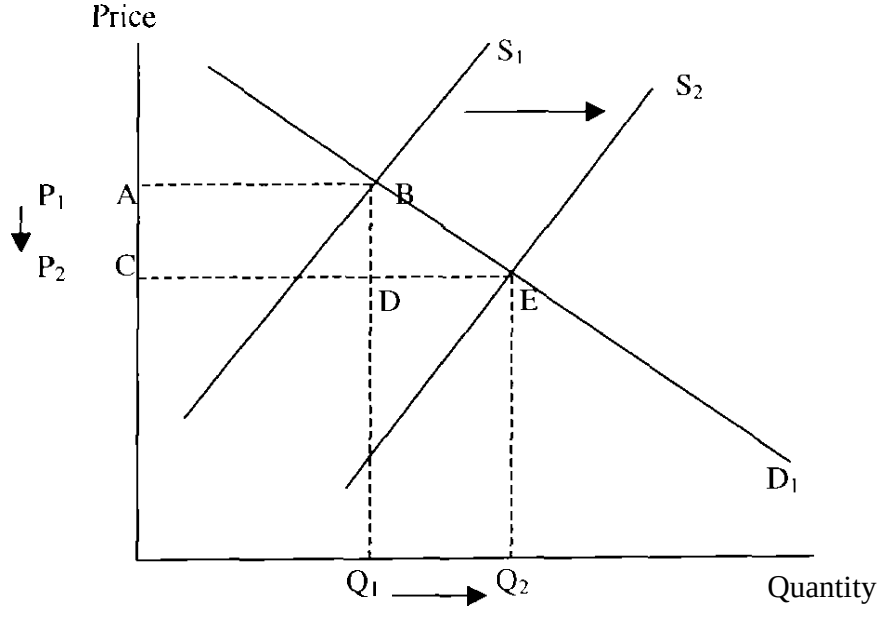
A. Measurement of Consumer Benefits from CLEC Entry

117. Consumer surplus is the difference between the total value that consumers place on their consumption of a good or service and the payment they make for the good or service. All else equal, if the price paid for a good or service declines, consumer surplus increases and consumers are better off. Consumers in markets for ADSL broadband Internet access benefit from the increased competition due to CLEC entry. To estimate such benefits, we calculate the change in consumer surplus for the **ADSL** residential and small business customers after CLEC had a significant entry. Since market demand is an aggregation of consumers' willingness to pay for a good or service, consumer surplus is the area under the demand curve and above the price line in a demand and supply diagram. This methodology of using changes in consumer surplus to evaluate consumer benefits from a policy is supported by microeconomic theory and is used by the **US** antitrust agencies in evaluating consumer savings from merger enforcement.[51]

[51] Both the Federal Trade Commission and the Department of Justice Antitrust Division estimate consumer *savings by multiplying* an estimate of the price increase that would have resulted but for the agency's merger enforcement by the volume of commerce in the relevant market. See Antitrust Division Congressional Submission for Fiscal Year 2001 and Prepared Statement of the Federal Trade Commission on Antitrust Enforcement Activities, Delivered by Chairman Robert Pitofsky, Before the Committee on the Judiciary, U.S. House of Representatives (April 12,2000). This is an approximation to the loss of consumer surplus that would have resulted if an anticompetitive merger were approved. In our case, we have the advantage of being able to observe actual prices and volumes at least in estimating realized gains in consumer surplus due to the CLEC entry.

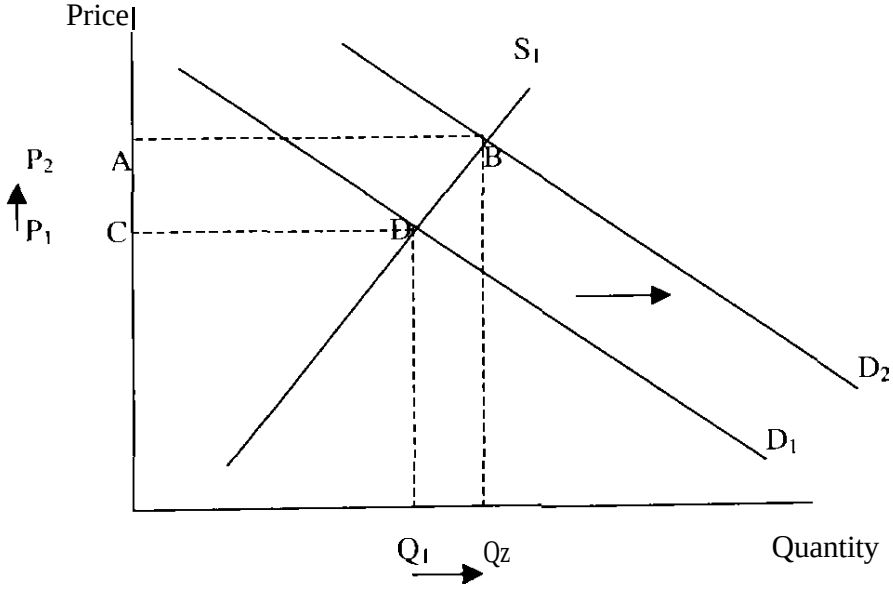
118. To begin with, let's look at a simple scenario where demand for ADSL remains constant during the course of the CLEC entry. **Figure 1** shows that the CLEC entry causes the supply curve to shift out. **As a** result, output increases from Q_1 to Q_2 and price drops from P_1 to P_2. The consumer surplus before the entry is the area under the demand curve D_1 and above the price P_1. After the entry, consumer surplus becomes the area under the same demand curve (since demand is assumed constant) and above the new market price P_2. In this example, total consumer surplus has increased. The <u>increase</u> in consumer surplus is the area ACEB.

Figure 1: Supply Shift Due to CLEC Entry



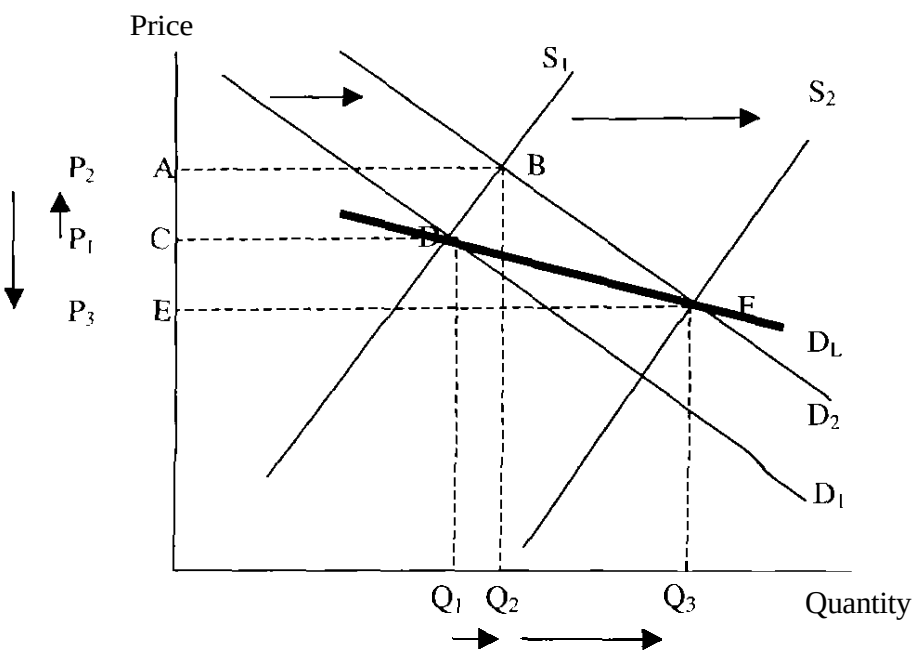
119. Let's look at another scenario, where there is no CLEC entry so that the supply curve in the ADSL market docs not shift. However, in this example we assume that the demand for **ADSL** continues to grow over time. In this example, price will go up. **Figure 2** illustrates this scenario. Demand shifts out from D_1 to D_2. As a result, output increases from Q_1 to Q_2 and price goes up from P_1 to P_2. This means the ADSL market will grow slowly driven by the demand growth. But consumers will have to pay a higher price for the service.

Figure 2: Demand Shift without CLEC Entry



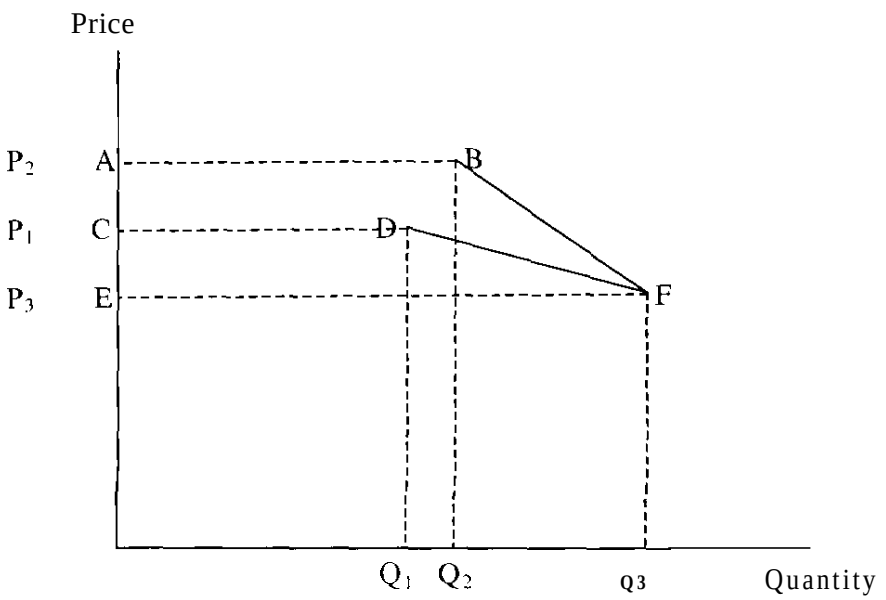
120. **A** more realistic scenario combines the above two scenarios, where demand for broadband internet access grows over time and supply increases due to the CLEC entry. This is shown in **Figure 3.** ***At*** the beginning. the market is described by demand D_1 and supply S_1, where market output is Q_1 and market price is P_1. The demand growth and the CLEC entry may happen simultaneously. For clarity of our analysis, we decompose the changes in demand and supply into a sequence. First, demand shifts from D_1 to D_2. This causes output to increase from Q_1 to Q_2 and price to increase from P_1 to P_2. Then supply increases due to the entry of CLEC. **As** a result, supply curve shifts from S_1 to S_2. Output increases further to Q_3 and market price drops to P_3. Data of the ADSL market shows that this drop in price more than offsets the price increase effect of the demand growth, as shown **in Figure 3.**

Figure 3: Demand Shift and Supply Shift Due to CLEC Entry



121. The change in consumer surplus due to the CLEC entry is the area **AEFB** in **Figure 3.** This area **is** difficult to measure precisely without enough data on price, output, and demand factors that shift the demand curve. Since demand and supply changes happen simultaneously, in reality we only observe two data points D and F, not B. The demand curve connecting D and F is indeed a demand curve of longer term (D_L). We can estimate the change in consumer surplus under this long term demand curve, which is area CEFD. Under a linear demand curve, we have: Area CEFD=((P1-P3)*Q1+(P1-P3)*(Q3-Q1)/2)*12 for one year. **Figure 4** is the simplified version of **Figure 3.** Notice that area **CEFD** is what we will estimate, which is a smaller area than the true increase in consumer surplus, area AEFB.

Figure 4: Gains in Consumer Surplus Due *to* CLEC Entry



122. Notice that the assumption of the shape of the demand curve, though will affect the calculation of area CEFD, does not affect the observation that area CEFD is smaller than area AEFB. Thus by calculating area CEFD. we in effect underestimate the consumer benefits from the CLEC entry.

B. Gains in Consumer Surplus from 1999-2002

123. As shown in schedule 3, Verizon's initial DSL deployment envisioned a monthly price of $69.95. Only after several CLECs entered the DSL market throughout 1998, and under the pressure that the FCC would adopt line-sharing rules, which it did in 1999, Verizon started to cut its price, first to $59.95 on October 1998, then to $49.95 on April 1, 1999, and most recently $39.95 in October 2002. The average price weighted by the number of months, in which a price is applicable, for 1999 is $52.45, and for 2002 is $47.45.

124. As shown earlier in this declaration, there were 291,757 residential and small business ADSL lines as of December 1999,772,272 lines in June 2000, and 2,490,740 lines *in* June 2001. For 2000 and 2001, the June data should be about the average number of lines in the year. For 1999, we assume the average number of lines is half of the December number, that is, 291,757/2=145,879. Data on the number of residential and small business ADSL lines are not available for 1998. We conservatively assume that there were only one-tenth of the number of lines in 1999, that is, 145,879/10=14,588.

125. If we use Verizon prices as the average prices for all ILECs and CLECs for these ycars, then we can estimate gains in consumer surplus from 1999 to 2002 for residential and small business customers. We are being conservative in this calculation for two reasons: (I) we ignore installation fees, which were also dropping in this time frame; (2) Covad's prices fell to a lower level than the ILECs charged. In June 2002, Covad announced that its TeleSurfer Link product was priced at $21.95 for the first four months and $39.95 thereafter, with free equipment and installation and no annual contract.

126. The area CEFD for 1999 is: [($69.95-$52.45)* 14,588+($69.95-$52.45)*(772,272-14,588)/2]*12=$16,848,967. Similarly, the area CEFD for 2000 is: [($69.95-$49.95)* 14,588+($69.95-$49.95)*(772,272-14,588)/2]*12=$94,423,182, and the area CEFD for 2001 is: [($69.95-$49.95)* 14,588+($69.95-$49.95)*(2,490,740-14,588)/2]*12=$300,639,342.

127. The actual number of ADSL lines is not available for 2002. But we can calculate expected gains in consumer surplus for 2002 based on the forecast of the number of **ADSL** lines. Securities analysts at J.P. Morgan forecast the number of ADSL lines subscribed.[52] This forecast is different from numbers shown in the FCC survey and J.P. Morgan does not forecast specifically the number of residential and small business ADSL lines. For proper comparison, we impute the number of residential and small business ADSL lines from J.P. Morgan's forecast of total number of

[52] Industry Update, J.P. Morgan Securities Inc., September 17, 2002

ADSL lines. For 2001, J.P. Morgan's estimate of total ADSL lines is 3,166,000, while FCC's survey shows that there were 2,490,740 residential and small business lines. The ratio between the two numbers is 2,490,740/3,166,000=78.7%. This ratio is used in deriving the expected number of residential and small business lines for future years. For 2002, it is 4,811,000*78.7%=3,784,886. So the area CEFD from 2001 to 2002 is expected to be: [($69.95-$47.45)* 14,588+($69.95-$47.45)*(3,784,886-14,588)/2]*12=$651,454,360.

128. To summarize, the gains in consumer surplus for residential and small business customers from the CLEC entry to the ADSL market due to the FCC's line sharing rules for the past four years (1999-2002) are at least: $16,848,967+$94,423,182+$300,639,342+$651,454,360=$1,063,365,851, or over $1 billion.

129. It is worth noting that our estimates of consumer benefits are conservative for the following reasons: (1) as noted earlier, we estimate a smaller area than the true gains in consumer surplus. The higher the growth in demand, the higher price would be in the absence of CLEC entry, the more we underestimate the consumer gains; (2) we apply the industry average price across the whole year, even though in fact the number of lines increases during the year while lower prices are observed during the later part of the year; (3) average prices based on Verizon's prices are conservative. CLECs generally charged lower prices than ILECs; (4) we ignore installation fees or equipment fees, which also decrease over time,

C. Expected Gains in Consumer Surplus for the Next Four Years

130. Applying the same methodology used in estimating the expected gains in consumer surplus for 2002, we can calculate such expected gains for the next four years (2003-2006).

131. As indicated earlier, Covad offered a new DSL service in June 2002 priced at $21.95 for the first four months and $39.95 thereafter, with free equipment and installation and no annual contract. We conservatively assume that the industry average price will only drop to $29.95 per month in 2006 with line sharing. This is a conservative assumption given that Covad has already offered a promotional price at $21.95. We also assume that this price drop will be gradual. Since the total price decrease will be $39.95-$29.95=$10 during the four year period, we assume that price drops by $2.5 each year. So price will be $37.45 per month in 2003, $34.95 in 2004, $32.45 in 2005, and $29.95 in 2006.

132. J.P. Morgan forecasts that the total number of DSL subscribers will be 6,605,000, 8,062,000, 9,318,000 and 10,422,000 in 2003, 2004, 2005 and 2006, respectively. Adjusted by the 78.7% ratio, we get 5,196,253, 6,342,497, 7,330,611 and 8,199,145. They are the expected number of residential and small business ADSL subscribers for each of the next four ycars with line sharing.

133. Without line sharing, we assume that the average monthly price for ADSL service for residential and small business customers will stay at the 2002 level equal to $39.95. This is a reasonable and probably conservative

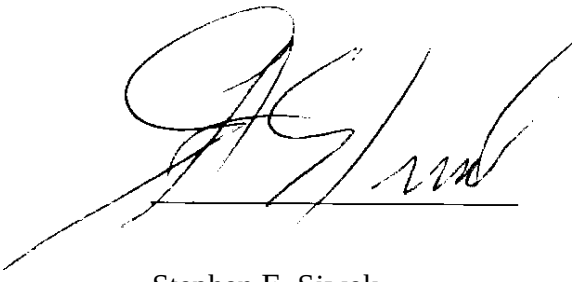
assumption given that with continually growing demand, price would be likely to rise without line sharing.

134. The area CEFD for 2003 is expected to be: [($39.95-$37.45)* 3,784,886+($39.95-$37.45)*(5,196,253-3,784,886)/2]*12=$134,717,093. The area CEFD for 2004 is expected to be: [($39.95-$34.95)* 3,784,886+($39.95-$34.95)*(6,342,497-3,784,886)/2]*12=$303,821,504. The area CEFD for 2005 is expected to be: [($39.95-$32.45)* 3,784,886+($39.95-$32.45)*(7,330,611-3,784,886)/2]*12=$500,197,393. The area CEFD for 2006 is expected to be: [($39.95-$29.95)* 3,784,886+($39.95-$29.95)*(8,199,145-3,784,886)/2]*12=$719,041,865.

135. Thus the gains in consumer surplus for residential and small business customers from the FCC line sharing rules for the next four years (2003-2006) are at least: $134,717,093+$303,821,504+$500,197,393+$719,041,865= $1,657,777,855, or over $1.6 billion.

136. Again, we estimate the consumer benefits from line sharing conservatively. In particular, (1) we calculate a smaller area than the true gains in consumer surplus; (2) we use **a** simple average price, not taking into account the fact that a growing number of lines later in a year are likely to be charged a lower price; (3) our assumption that with line sharing price will be $29.95 per month in 2006 is conservative. Given that Covad already offered a promotional price of $21.95 in 2002, actual price in 2006 is likely to be lower than $29.95 that we assumed; (4) our assumption that without line sharing price will be $39.95 per month from 2003-2006 is conservative. $39.95 was a price achieved following

Covad's lead. If line sharing is not allowed and CLECs are out of the **ADSL** market, price is likely to go **back** up.



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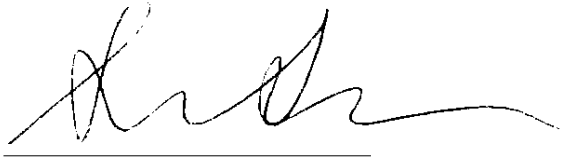

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Schedule 8

Cable Modem Industry Specific Comments

Cable Modem

- Tell the truth about the speed of cable, which has been grossly exaggerated in their advertising--they claim up to 100 times the speed of typical dialup services. Whilst the 'up to' makes the statement true, it suggests that you can at least sometimes achieve 100 times the speed which is never the case.

- Eliminate the interruptions in service during the day. Lose service from anywhere of a few seconds to up to one hour a 4 - 5 times a day. With my VPN when I lose service my computer becomes locked.

- It's not as fast as advertised.

- I consider cable modem service very expensive, but it is still better than the dial up service that rang busy most of the time.

- The service is frequently down or extremely slow. Hold times for customer support is extremely long. The support personnel at 1st level have very little technical knowledge. Overall Comcast does a terrible job as a cable TV provider. Too much time as a monopoly is my personal opinion. If I had ANY other choice for high speed access I would take it. Even at twice the price... are you getting the idea?

Schedule 9

Telework Beat:

Cable modem madness

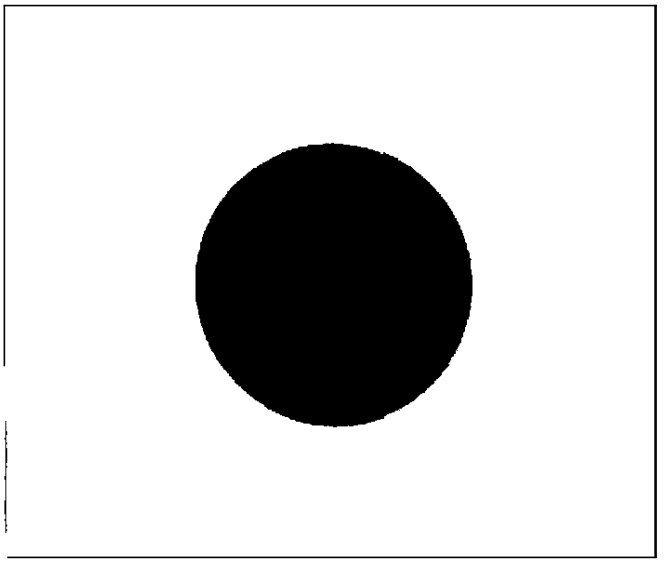
What's behind AT&T Broadband's rate increase?

By Toni Kistner
Network *World, 06/10/02/02*

AT&T Broadband recently gave its subscribers some puzzling news. A price restructuring will "save" cable modem renters $7 per month while charging cable modem owners $7 more per month. Or, put another way, the new plan charges renters $3 more per month and owners $7. Yet renters will pay the same amount they do now. Confused? Me, too.

Here's how it works: Today, base pricing for nearly all AT&T Broadband customers is $35.95 per month. But those who rent the modem pay $10 to do so, upping their rate to $45.95 per month. Under the new plan effective July 1, base pricing for everyone increases $7 to $42.95. But AT&T Broadband will now decrease the cable modem rental fee from $10 to $3, in effect, giving renters a $7 price break. However, modem owners will pay $7 more (from $35.95 to $42.95) and that's that. (To appease modem owners, AT&T Broadband is sending them coupons that defer the rate increase to January 2003.)

An AT&T Broadband spokesperson says the restructuring is in reaction to the steep



drop in modem prices - from $300 two fears ago to $70 today.

"But they're not passing on the cost savings to the customer," says Mike Wolf, an analyst with Instat. "It's a pretty sneaky move but one that may get overlooked by the end user."

Instead of announcing an across-the-board price hike - which is what this is - AT&T Broadband has spun the restructuring as a rate decrease for its modem renters, who make up 90% of its 1.6 million subscribers. Worse, the drop in modem prices means AT&T Broadband is making more money from modem renters than ever.

So where does all this leave AT&T Broadband's 1.6 million customers - 90% of whom lease their modems? Overall, modem buyers are more tech savvy than modem renters. The 10% who knew enough to buy the modem and pay a cheaper rate will lose the benefit. So much for being smart; there's always DSL. But the company assumes these users won't complain or jump to DSL because they've already invested in the hardware. We'll see.

And the modem renters? If they've already chosen to pay $10 per month for the privilege of using someone else's hardware, they'll probably believe that AT&T Broadband is cutting them a break. (And that AOL 7.0 is faster, too.) Nevertheless, such a move could foster a long-term loyalty, and even prime them over time to buy additional services with the money they think they've saved.

What's more, "AT&T Broadband wants to ensure that every new customer leases rather than buys the modem, especially since it's figured out how to make money leasing," adds Michael Greeson, Parks senior analyst and director of **broadband** research.

Of course, modem leasing is just one model cable operators experiment with to generate revenue. Cox Communications keeps its monthly service fixed at $34.95, but charges a high $15 per month as a modem rental fee, which in turn drives many users to buy the modem. Then Cox turns around and sells modems for as much as $149, delivering more

than $80 profit per box, according to a recent Kinetic Research report.

"We do not lease our modems," a Time Warner Cable spokesperson says. "Our approach is to get the most sophisticated boxes into the home, so that they would provide a gateway to a myriad of new services we could turn on or off at the customer's request. Our revenues would be derived in selling those services, not leasing the hardware."

Related Links

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Modem owners get AT&T cable surprise

By Rachel Konrad
Special to ZDNet News
May 28, 2002, 1 25 PM PT

Tell us your opinion!

A new pricing structure from **AT&T** will result in modem owners paying an extra ***$7*** for their high-speed Internet **service.**

ATBT Broadband Internet will announce later Tuesday several changes lo the way it charges for its cable modems. AT&T marketing executives framed the changes as price reductions based on the decreasing cost of hardware, but the end result will be higher costs lor roughly 162,500 AT&T customers who own their own cable modems.

Almost all ATBT broadband customers now pay $35.95 per month for high-speed Internet sewice. Those who tease modems through ATBT pay an additional $10 per month for a total of $45.95, and those who own their own modems pay no additional fee.

Starting on June 1 in most regions, AT&T will increase the monthly service rate lo $42.95 Customers who lease their modem from AT&T will have their lease fee reduced by $7, paying an additional $3 per month for the modem. That will make their monthly bill come to $45.95--the same price they paid last month.

But bills will increase for the 10 percent of AT&T's 1.63 million customers who own their own modems. Their monthly service tee will also go up lo $42.95, which means they're going to pay $7 per month more than they paid last month

Although the price restructuring will appear in customers' next statement. modem owners won t feel the sting lor six months. ATBT will include in the next statement six coupons for $7 off monthly service. letting modem owners off the hook for the new rates until January New subscribers who own their own modems will pay $42.95 per month as soon as they sign up.

Darrel Hegar, vice president of Inlernet services for Englewood. Colo.-based ATBT Broadband, said the changes reflected price reductions for cable modems. When home broadband access became popular in the late 1990s and in 2000, cable modems cost $300 or more. But in the past two years, the price has dropped to $100 of less, thanks in part to

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Hegar also noted that AT&T's service is still priced lower than allernalive broadband service lrom DSL (digital subscriber line) providers, which typically charge $50 or more per month. Although connection speeds lor cable modem users aren't as consistent as those for DSL subscribers, cable modem users generally report faster upstream speeds.

"If you look at the price of our service, it really still reflects one of the besl values in the marketplace." Hegar said Tuesday morning. "Cable Internet continues lo he the best way to access broadband vs. DSL or satellite. If you look at availability, speed and price, we are still a value leader."

Based on Ihe number of people paying an additional $7 per monlh. AT&T stands lo gain $1.14 million in monthly revenue from the restructuring. But it's unclear why AT&T representatives announced the restrucluring as a break for modem leasers as opposed lo a simple price hike lor 10 percent of cuslomers.

The decision to increase prices lor modem owners could be due to the fact that owners have sunk more of their own money into the service and would he less likely to switch to DSL or another broadband alternative, according to Mark Kersey, broadband industry analyst for La Jolla, Calif.-based research group ARS.

"People who own their modems are pretty much locked in lo staying with AT&T," Kersey said. "It's a way to extract a little more money out of a small percentage of people. That's a fairly politically smart thing lo do because it doesn't affect the vast majority of customers."

The restructuring could also be an effort to make AT&T's broadband unit more attractive to smaller rival Comcast, which in December announced its intention to purchase the AT&T unit for about $37 billion. The combined company, AT&T Comcast. would be the No. 1 U.S. cable TV operator with more than 22 million subscribers. Bul the structure of the new company recently came under fire, and shareholders are beginning to question whether to approve the deal.

Despite eflorts to boost revenue, AT&T cannot raise monthly broadband rates indiscriminalely Although demand lor high-speed Inlernet connections is still growing, the economic slump has slowed growth somewhal and has resulted in a growing number of broadband defectors And the industry is still reeling from the painful collapse of former front runner Excite@Home

The company's demise caused cable partners, particularly AT&T, lo scramble to migrate consumers to independent networks, causing customer service nightmares lor millions of people. Before its collapse last lall, Excite@Home had 4.1 million customers and controlled about 45 percent of the U.S. home-broadband market.

Customers are already grumbling that the government should regulate broadband service and access rates, which have risen steadily in the past year. An ARS study determined that cable broadband Internet prices rose 12 percent in 2001, lrom an average of 939.40 per month in January lo $44 22 per month in December. Consumer DSL prices *rose* 10 percent during the same time lrame frorn $47 18 in January to *$51* 67 in December.

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Schedule 10

Broadband Reports
DSL Products Pricing Summary

Company	Res/Biz	Type	DSL Provider	Speed	Ip	Net Install	Per Month	Free Mbxs/Ips	Equipment
BEANnet Interactive	R	ADSL	WorldCom	602/128	static	$299	$69	99box/1ip	USB
BEANnet Interactive	R	ADSL	WorldCom	1544/768	static	$299	599	99box/1ip	USB
BEANnet Interactive	A	SDSL	WorldCom	128/128	static	**5599**	$145	99box/1ip	USB
BEANnet Interactive	A	SDSL	WorldCom	160/160	static	$599	$149	99box/1ip	USB
BEANnet Interactive	A	SDSL	WorldCom	1841184	static	8599	$189	99box/1ip	USB
BEANnet Interactive	A	SDSL	WorldCom	786/786	static	$599	9229	99box/1ip	USB
BEANnet Interactive	A	SDSL	WorldCom	1192/1192	static	$599	$289	99box/1ip	USB
BellSouth	R	ADSL	BellSouth	1500/256	dhcp	675 - 324.95	419	5box/	USB
BellSouth	B	ADSL	BellSouth	15001256	choice	$249.95 - 325	$79	5box/	USB
CenturyTel	A	ADSL	CenturyTel	512/256	dhcp	$155	$50	1box/1ip	External
CenturyTel	A	ADSL	CenturyTel	512/256	static	$155	$70	1box/1ip	External
CenturyTel	A	ADSL	CenturyTel	512/256	dhcp	$280	$80	10box/1ip	Router
CenturyTel	A	ADSL	CenturyTel	512/256	static	$280	$100	10box/1ip	Router
Covad	R	ADSL	Covad	384/128	PPPoE	$99	$40	1box/1ip	External
Covad	R	ADSL	Covad	1500/128	PPPoE	$99	549	5box/1ip	External
Covad	R	ADSL	Covad	1/128	PPPoE	$99	$50	15box/1ip	Router
Covad	A	ADSL	Covad	1500/384	PPPoE	$199	869	15box/5ip	Router
Covad	A	ADSL	Covad	1500/384	static	$199	*$79*	5box/5ip	Router
Covad	A	IDSL	Covad	144/144	choice	$584	$149	15box/5ip	Router
Covad	A	SDSL	Covad	192/192	choice	$584	$149	15box/5ip	Router
Covad	A	SDSL	Covad	384/384	choice	$584	$179	15box/5ip	Router
Covad	A	SDSL	Covad	768/768	choice	$584	5239	15box/5ip	Router
Covad	A	SDSL	Covad	1500/1500	choice	$584	5369	15box/5ip	Router
DirecTV DSL	R	ADSL	Qwest	640/256	static	free	$49	5box/1ip	Router
DirecTV DSL	R	ADSL	Ameritech	768/128	static	free	$49	5box/1ip	Router
DirecTV DSL	R	ADSL	Verizon	1500/128	static	free	$49	5box/1ip	Router
DirecTV DSL	R	ADSL	BellSouth	1500/128	static	free	$49	5box/1ip	Router
DirecTV DSL	R	ADSL	Pacbell	1500/128	static	free	$49	5box/1ip	Router
DirecTV DSL	R	ADSL	Southwestern Bell	1500/128	static	free	$49	5box/1ip	Router
EarthLink DSL	R	ADSL	Verizon	1500/128	PPPoE	free	$49	8box/	USB
EarthLink DSL	R	ADSL	BellSouth	1500/128	PPPoE	free	$49	8box/	USB
EarthLink DSL	R	ADSL	Verizon (ex GTE)	1500/128	PPPoE	free	$49	8box/	USB
EarthLink DSL	R	ADSL	Pacbell	1500/128	PPPoE	free	$49	8box/	USB
EarthLink DSL	R	ADSL	Southwestern Bell	1500/128	PPPoE	free	$49	8box/	USB
EarthLink DSL	R	ADSL	Covad	1500/384	PPPoE	free	$49	8box/	USB
EarthLink DSL	B	SDSL	Covad	144/144	static	$585	$129	10!box/8ip	Router
EarthLink DSL	B	SDSL	Covad	192/192	static	$585	$139	10!box/8ip	Router
EarthLink DSL	B	SDSL	Covad	384/384	static	$585	$199	10!box/8ip	Router
EarthLink DSL	B	SDSL	Covad	768/768	static	$585	$289	10!box/8ip	Router
EarthLink DSL	B	SDSL	Covad	1100/1100	static	$585	$349	10!box/8ip	Router
EarthLink DSL	B	SDSL	Covad	1500/1500	static	$585	*$199*	10!box/8ip	Router
IP Communications	B	ADSL	IP	1500/128	dhcp	$199	*171*	1box/	Router
IP Communications	B	SDSL	IP	192/192	static	$199	$88	5box/1ip	Router
IP Communications	B	IDSL	IP	144/144	static	$199	$1 10	5box/1ip	Router
IP Communications	B	SDSL	IP	384/384	static	$199	$110	5box/1ip	Router
IP Communications	B	SDSL	IP	768/768	static	$199	$176	5box/1ip	Router
IP Communications	B	SDSL	IP	1000/1000	static	$199	$220	5box/1ip	Router
IP Communications	B	SDSL	IP	1500/1500	static	$199	$329	5box/1ip	Router
MegaPath Networks	R	ADSL	Covad	608/128	static	$198	$60	5box/	Router
MegaPath Networks	R	ADSL	Pacbell	768/128	static	$248	$65	5box/	Router
MegaPath Networks	R	ADSL	Covad	1500/128	static	$198	$65	5box/	Router
MegaPath Networks	B	ADSL	Covad	608/128	static	$198	$80	50box/	Router
MegaPath Networks	R	ADSL	Pacbell	1500/128	static	$248	$80	5box/	Router
MegaPath Networks	R	ADSL	Covad	1500/384	static	$198	$80	5box/	Router
MegaPath Networks	B	ADSL	Pacbell	768/128	static	$248	\hi	50box/	Router
MegaPath Networks	B	ADSL	Covad	1500/128	static	$198	$85	50box/	Router
MegaPath Networks	B	ADSL	Pacbell	1500/128	static	$248	$105	50box/	Router
MegaPath Networks	B	ADSL	Covad	1500/384	static	$198	$105	50box/	Router
MegaPath Networks	B	IDSL	Covad	144/144	static	$124	$110	50box/	Router
MegaPath Networks	R	IDSL	Covad	144/144	static	$124	$110	5box/	Router
MegaPath Networks	B	SDSL	Covad	192/192	static	$124	$110	50box/	Router

Broadband Reports
DSL Products Pricing *Summary*

Company	Res/Biz	Type	DSL Provider	Speed	Ip	Net Install	Per Month	Free Mbxs/Ips	Equipment
MegaPath Networks	B	SDSL	New Edge	1921192	static	$299	$110	50box/	Router
MegaPath Networks	B	SDSL	IP Communications	192/192	static	$400	$110	50box/	Router
MegaPath Networks	R	SDSL	Covad	192/192	static	$124	$110	5box/	Router
MegaPath Networks	R	SDSL	New Edge	192/192	static	$174	$110	5box/	Router
MegaPath Networks	R	SDSL	IP Communications	192/192	static	$400	$110	5box/	Router
MegaPath Networks	B	IDSL	New Edge	144/144	static	$299	$120	50box/	Router
MegaPath Networks	K	SDSL	Covad	384/384	static	$124	$140	5box/	Router
MegaPath Networks	K	SDSL	New Edge	384/384	static	$174	$140	5box/	Router
MegaPath Networks	K	SDSL	IP Communications	384/384	static	$400	$140	5box/	Router
MegaPath Networks	B	SDSL	Covad	384/384	static	5124	$180	50box/	Router
MegaPath Networks	H	SDSL	New Edge	384/384	static	$174	$180	50box/	Router
MegaPath Networks	B	SDSL	IP Communications	384/384	static	$400	$180	50box/	Router
MegaPath Networks	R	ADSL	Pacbell	4000/384	static	$248	$180	5box/	Router
MegaPath Networks	K	SDSL	Covad	768/768	static	$124	$200	5box/	Router
MegaPath Networks	R	SDSL	New Edge	768/768	static	$174	$200	5box/	Router
MegaPath Networks	B	ADSL	Pacbell	4000/384	static	$248	$230	50box/	Router
MegaPath Networks	K	SDSL	Covad	1000/1000	static	$124	$250	5box/	Router
MegaPath Networks	R	SDSL	New Edge	1000/1000	static	$174	$250	5box/	Router
MegaPath Networks	B	SDSL	Covad	768/768	static	$1 24	$260	50box/	Router
MegaPath Networks	B	SDSL	New Edge	768/768	static	5174	$260	50box/	Router
MegaPath Networks	H	SDSL	IP Communications	768/768	static	$400	$260	50box/	Router
MegaPath Networks	R	SDSL	Covad	1500/1500	static	$124	'6300	5box/	Router
MegaPath Networks	K	SDSL	New Edge	1500/1500	static	$174	16300	5box/	Router
MegaPath Networks	B	SDSL	Covad	1000/1000	static	$124	*5330*	50box/	Router
MegaPath Networks	B	SDSL	New Edge	1000/1000	static	$174	$330	50box/	Router
MegaPath Networks	B	SDSL	Covad	1500/1500	static	5124	*$400*	50box/	Router
MegaPath Networks	B	SDSL	New Edge	1500/1500	static	8174	$400	50box/	Router
Pacifier Online	B	SDSL	Covad	144/144	choice	h90	na		USB
Pacifier Online	B	SDSL	Covad	192/192	choice	$100	na		USB
Pacifier Online	K	ADSL	Qwest	256/255	choice	$20	na		USB
Pacifier Online	B	SDSL	Qwest	256/256	choice	$100	na		USB
Pacifier Online	H	SDSL	Covad	384/384	choice	$200	"3		USB
Pacifier Online	R	SDSL	Verizon (ex GTE)	384/384	choice	160	na		USB
Pacifier Online	B	SDSL	Qwest	512/512	choice	$200	na		USB
Pacifier Online	R	ADSL	Qwest	640/272	choice	$20	na		USB
Pacifier Online	R	ADSL	Qwest	640/544	choice	$40	na		USB
Pacifier Online	R	ADSL	Verizon (ex GTE)	768/128	choice	$20	"3		USB
Pacifier Online	B	SDSL	Covad	768/768	choice	$300	na		USB
Pacifier Online	B	SDSL	Qwest	768/768	choice	$300	no		USB
Pacifier Online	It	ADSL	Qwest	960/816	choice	860	na		USB
Pacifier Online	R	ADSL	Qwest	1280/1088	choice	$80	"3		USB
Pacifier Online	R	ADSL	Verizon (ex GTE)	1500/128	choice	$40	na		USB
Pacifier Online	K	ADSL	Verizon (ex GTE)	1500/384	choice	$40	na		USB
SBC Pacific Bell	A	ADSL	Pacbell	384/128	dhcp	$99	$42	11box/	USB
SBC Pacific Bell	A	ADSL	Pacbell	384/128	dhcp	$99	$49	11box/	USB
SBC Pacific Bell	A	ADSL	Pacbell	768/256	dhcp	$99	$59	11box/	USB
SBC Pacific Bell	A	ADSL	Pacbell	384/128	static	$349	$64	11box/5ip	Router
SBC Pacific Bell	A	ADSL	Pacbell	768/256	static	$349	$79	11box/5ip	Router
SBC Pacific Bell	A	ADSL	Pacbell	1500/384	static	$349	$179	11box/5ip	Router
SBC Southwestern Bell	A	ADSL	Southwestern Bell	384/128	dhcp	\99	$42	10box/	USB
SBC Southwestern Bell	A	ADSL	Southwestern Bell	384/128	dhcp	$99	$49	10box/	USB
SBC Southwestern Bell	A	ADSL	Southwestern Bell	768/256	dhcp	$99	$59	10box/	USB
SBC Southwestern Bell	A	ADSL	Southwestern Bell	384/128	static	$349	$64	10box/5ip	External
SBC Southwestern Bell	A	ADSL	Southwestern Bell	768/256	static	$349	$79	10box/5ip	External
SBC Southwestern Bell	A	ADSL	Southwestern Bell	1500/384	static	$349	$179	10box/5ip	External
Speakeasy.net	R	RADSL	Covad	608/128	dhcp	$225	$49	2box/	External
Speakeasy.net	R	RADSL	Covad	608/128	static	$225	$59	2box/2ip	External
Speakeasy.net	R	RADSL	Covad	1500/128	dhcp	$225	$59	2box/	External
Speakeasy.net	R	RADSL	Covad	1500/128	static	$225	$69	2box/2ip	External
Speakeasy.net	R	IDSL	Covad	144/144	static	$584	$89	2box/2ip	External
Speakeasy.net	R	RADSL	Covad	1500/384	static	$225	$89	2box/2ip	External

Broadband Reports
DSL Products Pricing Summary

company	Res/Biz	Type	DSL Provider	Speed	Ip	Net Install	Per Month	Free Mbxs/Ips	Equipment
Speakeasy net	R	SDSL	Covad	384/384	static	$374	$119	2box/4ip	External
Speakeasy net	B	IDSL	Covad	144/144	static	$584	$124	10box/32ip	Router
Speakeasy net	B	SDSL	Covad	1921192	static	$584	$124	10box/32ip	Router
Speakeasy net	R	SDSL	Covad	768/768	sialic	$374	$159	2box/4ip	External
Speakeasy.net	B	SDSL	Covad	384/384	static	$584	$169	10box/32ip	Router
Speakeasy.net	R	SDSL	Covad	1100/1100	static	$374	$199	2box/4ip	External
Speakeasy ncr	B	SDSL	Covad	768/768	static	$584	$249	10box/32ip	Router
Speakeasy.net	B	SDSL	Covad	1100/1L00	static	$584	$299	10box/32ip	Router
Speakeasy.net	R	SDSL	Covad	1500/1500	static	$374	$299	2box/8ip	External
Speakeasy net	B	SDSL	Covad	1500/1500	static	$584	$399	10box/32ip	Router
TJpspecd.com	A	ADSL	New Edge	384/128	choicr	free	$69	10box/1ip	External
Tagspeed com	A	ADSL	New Edge	7681384	choice	free	$89	20box/1ip	External
Tagspeed com	A	SUSL	New Edge	192/192	choice	free	$99	10box/2ip	Router
Tagspeed corn	A	SUSL	New Edge	384/384	choice	free	$119	20box/2ip	Router
Tagspeed.com	A	IDSL	New Edge	1441144	choice	$149	$139	10box/2ip	Router
Tagspeed com	A	SDSL	New Edge	7681768	choice	free	$149	30box/2ip	Router
Tagspeed cum	A	ADSL	New Edge	15001384	choice	free	$159	20box/2ip	External
Tagspeed.com	A	SDSL	New Edge	I10011100	choice	free	$169	50box/2ip	Router
Tagspeed corn	A	SUSL	New Edge	1500/1500	choice	free	$179	30box/2ip	Router
Tagspeed.com	A	SDSL	New Edge	2300/2300	choice	free	$275	50box/3ip	Router
Tagspeed corn	A	ADSL	New Edge	4000/384	choice	free	$339	25box/2ip	External
Tagspeed corn	A	ADSL	New Edge	72001384	choice	free	$449	30box/3ip	External

Source: www.broadbandreports.com

TR's ONLINE CENSUS

The Independent Quarterly Benchmark of Online Services

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Third Quarter 2002

Consumer Online Base Nudges Up *to* 73.7 Million Users In Lethargic Third Quarter; High-speed Migration Slows

By Gary H. Arlen
Editor

With new online users hard to find, and a diminished — albeit still lively — migration to high-speed access, the consumer online audience has reached its first-ever extended plateau. In the six months since our last comprehensive census of customers of U.S.-based Internet Service Providers, the number of users has remained relatively static. At the end of the third quarter (Sept. 30, 2002), these ISPs reached 73,693,662 customers, compared to 70,730,070 on March 31. That represents a scant growth of 4.2 percent during the past six months.

Last year, on Sept. 30, 2001, the customer base totaled 67.9 million, indicating a year-over-year growth of 8.51 percent — well below the blistering double-digit growth pace of the late 1990s.

The bright spot — although also somewhat dimmer than in earlier periods — is the continuing addition of high-speed access users, now representing about 20 percent of the online audience. Equally significant is the growth of the Digital Subscriber Line (DSL) customer base, which is nearly 43 percent of the broadband audience — up from about 33 percent a year ago.

At just under 8.6 million customers, the cable modem audience itself is up nearly 12 percent compared to March 31 and nearly **62** percent above Sept. 30, 2001, levels. DSL growth is accelerating even more quickly, reaching 6.46 million customers at the end of third quarter 2002. That tally is

Total Online Census by Category

Customer Base as of September 30, 2002

Category of ISP	Sept. 30,2002	Six Months Ago	One Year Ago	Growth compared to: 3/31/02	Growth compared to: 9/30/01
Dial-Up	58,456,262	58,463,470	58,144,750	- 0.01%	0.59%
DSL	6,463,000	4,393,000	3,524,000	47.1%	83.4%
Cable Modem	8,596,400	7,692,600	5,314,900	11.7%	61.7%
Satellite	178.000	181,000	114,000	-1.6%	56.1%
TOTAL	**73,693,662**	**70,730,070**	**67,909,650**	**4.19%**	**8.52%**

47 percent above the March 31 level and 83 percent higher than a year earlier.

The September 30 online census underscores the growing battle for a diminishing supply of "newbies" and, more significantly, the effort to lure customers away from their current ISPs as they take the broadband plunge. Those efforts are already accelerating — especially with the release of "Version 8" software from both Microsoft Network and America Online in mid-October, just a few weeks after the third quarter ended.

Even before the current recruitment binge began, MSN claimed to have signed up about 300.000 customers during the summer quarter — about 50 percent more than the 206,000 subscribers that arch-rival America Online added worldwide during the same period.

Moreover, most of AOL's growth continues to come from overseas expansion, although the pace of that growth has also slackened. During the latest reponing period. AOL added 129,000 U.S. users and 148,000 customers in Europe.

Overall, AOL's 35.3 million customers include 26.7 million in the United States, 6.1 million in Europe and 2.5 million through its alliances in the Pacific Rim and Latin America. AOL acknowledges that its membership dropped by 71,000 in Latin America **"due** primarily to difficult economic conditions."

AOL's share of the U.S. market also continues to dwindle. As recently as 1998, AOL reached more than 60 percent of those **U.S.** households that were online. Today barely 40 percent of **U.S.** homes go to the Internet via AOL or its subsidiary CompuServe (which now has three million subscribers).

Transitional Growing Pains

Economic uncertainties — which have discouraged potential U.S. customers from committing at a faster rate to the extra fees for high-speed service — plus continuing Complaints about broadband provisioning contributed to the slowing pace of broadband deployment.

In addition, other growing pains affected some ISPs. The financial implosion at Adelphia Communications Corp., prompted the company to restrict its broadband initiatives, which includes a decision not to reveal any sales figures. Privately held, independent ISP Inter.net Global, sold its dial-up business to an overseas company that it is prohibited from identifying; the new owner promptly abandoned its residential service offerings and most of its dial-up operations.

In the satellite sphere, StarBand remains in Chapter 11 bankruptcy reorganization but claims to have maintained its customer base of about 40,000 subscribers. It acknowledges that the 40,000 figure represents a constant replacement of its churning audience. StarBand emphasizes that during mid-summer it had to build a marketing assault from scratch after its tumultuous divorce from EchoStar Communications, Inc., the satellite broadcasting company that had been selling StarBand service for nearly two years.

Separately, rival DirecWay, operated by Hughes Network Systems, Inc., claims that it has added 15,000 customers during the third quarter. But its loosely described tally blends residen-

TR's ONLINE CENSUS

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The Largest Providers: Now and Then

Customer Growth of Major ISPs

	Sept. 30,2002	March 31,2002	Growth % from March to September 2002	Sept. 30,2001
America Online	35,300,000	33,200,000	**6.3%**	31,300,000
Microsoft Network	8,700,000	7,700,000	13.0%	6,500,000
EarthLink (Dial-up)	3,976,000	4,200,000	-5.3%	4,200,000
EarthLink (DSL)	681,000	532.000	28.0%	406,000
SBC (DSL)	1,950,000	1,500,000	30%	1,200,000

tial users and enterprise customers — both small and medium-sized businesses. Moreover, the HNS data fails to distinguish between true two-way satellite delivery and the company's long-standing hybrid service, which pairs a telephone line return path with its high-speed satellite downlink.

A more traditional but nonetheless challenging factor in the ISP tally involves wholesale operations. For example, Verizon Communications, Inc., supplies DSL service for much of EarthLink's high-speed offering. Hence. Verizon Online's overall customer base includes about two million users — half through its own branded retail DSL service, about a quarter through its Verizon Online dial-up retail offering, and another one-quarter through its wholesale DSL operation on behalf of EarthLink.

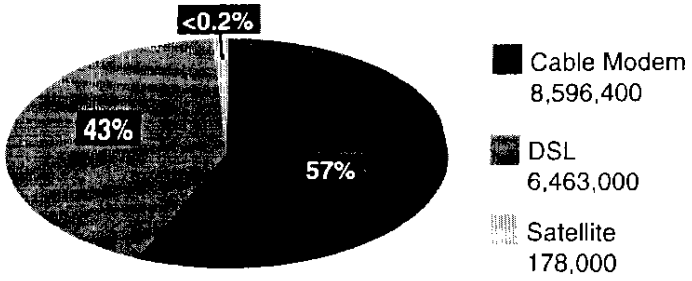
Meanwhile, the structure of the industry continues to change. On Nov. 5, United Online, Inc., bought the Internet access and e-mail service assets of *BlueLight.com*, a wholly owned subsidiary of Kmart Corp. United Online will pay about $8.4 million in cash for BlueLight.com's ISP operation. Most of the 19 BlueLight.com employees who are involved with ISP operations will become United Online employees. United says that BlueLight's subscribers will keep their current e-mail addresses.

United Online added 141,000 paying customers during the quarter, bringing its fee-based audience to 1.85 million, up 8 percent during the third quarter and 48 percent from September 2001. In addition. about three million "active users" (logging in within the past 31 days) are signed up for the company's free access service, NetZero. For the first time ever, more than half of the paying customers who signed up during the quarter were new to United Online, rather than those upgrading from its free services.

"In what we expected to be a seasonally challenging quarter, the company reported a sequential increase

High-speed Battleground

Number of Customers per Access Method



Satellite Service Provider Details

As of September 30,2002

Service	Parent	Monthly **Fee**	Customers	**Added** in **3Q02**
Starband	Slarband	$69.99/mo.	40,000	no change
DirecWay	**Hughes** Network Services	$59.99/mo.	138,000	new tally method
TOTALS				178,000

in pay subscriber additions, sequential growth in advertising and commerce revenues, and a reduction in average subscriber acquisition cost," said United Online Chairman Mark R. Goldston. United Online predicts it will add 260,000 to 300.000 new pay subscribers, including acquired BlueLight subscribers, by year-end, giving it a total of 2.11 million to 2.15 million paid subscribers. Its average monthly revenue per billable user (ARPU) is expected to be in the range of $9.55 to $9.65. and billable services revenues are projected to comprise approximately YO percent of total revenues, Goldston said.

High-speed data services continued to drive growth at bundled-services provider RCN Corp., although the net result of high-speed growth and dial-up decline was that RCN's total customer base dropped by about 0.24 percent during the past six months. As of Sept. 30. RCN had 163,393 high-speed data customers, representing 19.44 percent growth above the March 31 level and 9.21 percent above the June 30 figure. For its dial-up business, RCN lost almost 15,000 customers, ending the *third quarter* with 296,762 dial-up users, down 4.78 percent during the period and more than 10 percent below the March 31 level.

Covad Communications Group, Inc., increased its total line count to 359,000 nationwide. Its consumer service represented *5* I percent of that tally, while business subscribers were 49 percent — a slight shift from the even mix of the previous quarter. Although Covad added about 2,000 customers during the third quarter, that number matched the 2,000 user loss during the previous period — bringing Covad's customer count back to its March 31 level. About 9 percent of Covad's total lines are served through resellers, down from I I percent at the end of the second quarter.

Covad signed a five-year agreement with AOL to provide DSL service to AOL customers, with availability beginning by year-end. Covad also expanded its relationship with EarthLink and established an alliance with Sprint. Covad's new "Power to the People" TV marketing campaigns in San Francisco and Washington are intended to increase consumer awareness of Covad's direct broadband Internet access services.

The continuous tweaking of the distribution alliances and pricing models reflect the revamping that is necessary as this young sector moves through a period *of* economic uncertainty.

Broadband Boomlet

Despite such vagaries and the less torrid late summer pace (typically a

slow-growth season), the broadband escalation continued. The growth was fueled in part by competitive pricing — down into the $30 range, at least for introductory offers in many markets.

AOL now says that about 3.7 million of its members access the service via high-speed connections. That represents 10 percent of AOL's global audience or nearly 14 percent of its U.S. customer base. (The company declines to spell out the geographic focus of its broadband audience, although it can be assumed to be overwhelmingly domestic.) Some of **AOL's** high-speed users access the service through bundled offers via Time Warner Cable or through DSL partners, and many others use their AOL accounts through "BYOA" ("bring your own access") arrangements, i.e. independent broadband connections. AOL acknowledges "analysts' guesstimates" that about 500,000 customers use AOL Broadband connections directly.

Nowhere is the DSL migration more clearly demonstrated than in the shifting mix of the EarthLink customer base. Overall, EarthLink's dial-up audience declined about 5.3 percent from March 31 to Sept. 30 of this year. At the same time, its DSL audience climbed by 28 percent. Seen another way, DSL customers represented about 15 percent of EarthLink's customer base at the end of the third quarter, compared to about 1 I percent at the end of the first quarter of this year. By further comparison, just under *9* percent of EarthLink customers used its high-speed service in September 2001.

Telephone companies' DSL services showed similar growth during the middle of 2002. For example,

Cable Multiple System Operator Details

As of September 30, 2002

Service (Parent)	**Monthly** Fee	Customers	New users in **3Q**	% Increase
ATT Broadband (ATBT Inc.)	$42.95	1,934,000	172,000	9.76%
Comcast (Comcast Communications)	$39.95	1,300,000	169,800	15.02%
Cox High Speed Internet (Cox Commmunicalions Inc.)		1,272,300	157,000	14.08%
Charter Pipeline (Charter Communications Cor		1,055,000	150,000	16.57%
Optimum Online (Cablevision Systems Inc.)	$39.95	610,500	50500	9.02%
PowerLink (Adelphia communications Corp.)		400,000 e	**na**	
Road Runner (Time Warner Cable)	$44.95	2,300,000	257,000	12.58%
Insight (Insight Communictions Inc.)	$34 95	124,600	39,700	46.76%
TOTALS		**8,596,400**	**996,000**	**13.10%**

Internet Service Provider Details

	Price		Dial Up Subscribers		High Speed Subscribers			
ISP (Parent)	Dial Up	High Speed	Sept. 30, 2002	Added in 3Q	Sept. 30, 2002	Added in 3Q	Total	Growth since 3/31/02
America Online (America Online Inc.)	$23.90		31,600,000	206,000	3,700,000 includes 500,000 AOL Broadband direct users + 3,200,000 with other BB connections		35,300,000 (includes subscribers with independent broadband connections)	2.02%
AT&T WorldNet (AT&T Corp.)	$16.95/150 hours, $21.95/unlimited; prepaid service available	$39.95/month	2,000,000				2,000,000	NA
BellSouth Internet Service (BellSouth Corp.)	$15.95/unlimited (bellsouth customers); $21.95/unlimited	$45 DSL for "Complete Choice" customers; $20.95 Dial-Up	680,000		924,000	121,000	1,604,000	NA
Bluelight.com (Kmart)	$8.95		165,000	NA			165,000	17.50%
CompuServe (America Online Inc.)	$19.95 , unlimited.		3,000,000				3,000,000	0.00%
EarthLink (EarthLink Inc.)	$21.95 unlimited		3,976,000	106000	681,000	77,000	4,657,000	4.58%
MSN Internet Access (Microsoft Corp.)	$21.95	$9.95	9,000,000	300000			9,000,000	16.88%
PeoplePC (PeoplePC)	$12.95, unlimited		588,000				588,000	1.38%
SBC/Prodigy Internet (SBC Communications)		$29.95 DSL	1800000 (e)		1,950,000	226,000	3,750,000	new method *
Qwest (Qwest Communications Inc.)		$21.95 (without ISP), $39.95 with MSN	-na-		525,000	17,000		8.47%
RCN Starpower (RCN)	$17.95		296,762	14,910	164,000	14,098	460,762	1.48%
Stargate (Stargate Industries LLC)					90,000		90,000	na
United Online (United Online)	$9.95/mo (Juno) and Free (NetZero)		4,800,000 (includes 1,850,000 paying Juno users)	141,000			4,800,000	new method *
Cincinnati Bell (Broadwing Communications)					55,000 (e)		55,000	na
Covad (Covad Communications Group Inc.)		$39.95			359,000		359,000	0.00%
Telocity (Hughes Network Systems)		$49.99			151,000	18,000	151,000	33.63%
Verizon Online (Verizon Communications Inc.)	$21.95 dial-up unlimited	768 kbps/128 kbps $49.95	550500 (e)		1,064,000	155,000	1,614,000	new method *
TOTALS			58,456,262	526,000	6,463,000	626,398	64,919,262 **	

e = Estimate

na = not applicable or not available

* New Method = new methodology for subscriber analysis

** Does not include AOL users who bring their own broadband connections

BellSouth.net, the Internet access unit of BellSouth Corp., added 121,000 DSL customers during the third quarter of the year, following its second quarter growth of 74,000 DSL users.

SBC Communications, Inc., added 226,000 new DSL subscribers during the third quarter, bringing its total to more than 2 million. Verizon, which added 155,000 DSL customers during the three-month period, has introduced a slew of pricing plans — starting with a three month $29.95 introductory offer that slides into a $49.95 monthly fee for its basic DSL package (768 kilobits per second downstream and 128 kbps upstream). Verizon, like its Bell counterparts, offers a variety of special packages. For customers committing to a one-year DSL contract, the monthly price drops to $39.95. And in the 13 states where Verizon has been authorized to provide interLATA services, it offers its "Variations" bundled package of services (including long distance and custom calling features), in which the DSL component costs $34.95 per month.

Cable Modem Bandwagon

In the past, cable companies have beaten telephone companies to broadband subscribers by a two-to-one margin. But the cable modem lead over DSL is declining for the first time, despite the continuing growth of high-speed cable services as part of the industry's digital rollout. Our canvass

of the largest cable multiple system operators (MSOs) tallied 8.6 million customers, but an independent study by the National Cable and Telecommunications Association claims that about 10 million households have the service. NCTA's higher figure aggregates the srand-alone and custom services offered on hundreds of small cable systems not operated by the industry's giant MSOs — andbeyond the reach of our data collection.

Based on NCTA's tally, cable companies have about 61 percent of high-speed subscribers compared to the 57 percent in the *TR* analysis. In either case, the shift demonstrates a dramatic uptick for DSL service — reflecting the aggressive assault by Bell companies and some independent providers on the high-speed market.

NCTA says that cable modem service via upgraded broadband cable systems is now available to more than 75 million U.S. households. It says the 10 million cable modem customers represent more than 20 percent of households with computers that are passed by cable systems where high-speed data service is available.

Among the largest cable operators, Comcast Corp., added 169,800 high-speed Internet subscribers during the quarter, ending with 1.3 million cable modem subscribers. AT&T Broadband, the industry's largest firm, signed up 172,000 new cable modem users during the quarter. Both companies released their quarterly reports just before the FCC was expected to provide final approval of their merger.

Cox Communications, Inc., reported its highest-ever quarterly growth in cable modem customers during the third quarter — adding 157,300 broadband users, far more than its previous 40,000 quarterly jump. Cox plans to boost the price of its cable modem service by $5 per month in selected (but as yet unidentified) markets during the fourth quarter.

Insight Communications, the nation's ninth largest **MSO,** added 21,000 customers during the three-month period, also its largest quarterly growth ever.

What to Do with Dial-Up?

Despite the DSL and cable modem expansion, the traditional dial-up access industry continues to attract users — as underscored by the marketing war now being waged by AOL and MSN. MSN, with a $300 million marketing campaign for its version 8 software is outspending AOL, which has launched a $100 million advertising drive for its AOL 8.0 service. The duel is intended to lure customers away from other providers although it may bring some new customers into the online world.

EarthLink, United Online, and other veteran providers also continue to troll for new customers or users ready *to* churn away from their existing provider. But AT&T WorldNet acknowledges the difficulty of fighting that battle.

AT&T WorldNet — which will be reorganized after the looming spinoff of AT&T Broadband to Comcast — claims that it has made no significant growth attempts during the past year.

"We're not seeing **any** significant [marketing] attraction," an AT&T spokeswoman said about the modest WorldNet sales efforts. WorldNet has offered a prepaid access service, but she declined to provide details about

the usage rates or the conversion of this service's customers to full WorldNet users.

Other carriers continue to promote their dial-up offerings. For example, BellSouth offers several discounts for its basic ISP access services through its "Complete Choice" bundle of long distance and custom calling features. Until the end of 2002, BellSouth's dial-up service costs $9.95 monthly for the first three months and then $15.95 per month for customers who buy the entire package. For á là carte customers (i.e. those not buying the "Complete Choice" bundle), the monthly price, are $14.95 for the first three months, then $20.95 afterwards.

United Online continues to market its two services. Its fee-based Juno Online access services now has 1.7 million customers, while the ad-supported NetZero service (one of the last remaining "free" ISP connections) has 3.1 million subscribers — significantly below its peak of two years ago. Although United Online continues to extol the values and expected longevity of dial-up connections, a spokesman acknowledges that the company is exploring high-speed service.

United Online is "dipping our toe in the pool" of broadband, he says, through its alliance with Comcast, which is providing turnkey access to the Juno Broadband pilot project. United Online declines to identify how *many* customers ***have*** signed up for the broadband offering.

Other providers are experimenting in ad hoc alliances to find niches that can be used in the evolving ISP market. For example, PeoplePC is working with

Tweaking Services and Upgrades

As the ISP shake-out continues, access providers are enhancing their service package to offer price or convenience features. For example, Hughes Network Systems has added a Web feature so that its DirecWay customers can boost Web-browsing speeds by 30–50 percent. The new "Web Accelerator" feature is part of a free, downloadable service pack available exclusively to existing DirecWay users.

Qwest Communications International, Inc., and Verizon are expanding their portal relationships with MSN, although details are still being hammered out.

AOL is accelerating its wireless initiative. Among its latest deals was a pact with Verizon Wireless that will make AOL Instant Messenger **(AIM)** service available to Verizon Wireless customers, allowing them to send short messages to their "buddy lists" without going online via a PC. Verizon Wireless customers using the AIM service can exchange instant messages with others, regardless of whether they are signed on via a computer, mobile phone or other wireless device.

Most significantly, ISPs — especially broadband operators — are exploring price and packaging alternatives that will cater to the different demands of residential and small office/home office customers. For example, AT&T Broadband and Comcast say that after their merger they will introduce a higher-speed cable-modem tier and also a lower-data-rate tier. The new "UltraLink" service will provide up to 3 megabits per second downstream and 384 kilobits per second upstream. It is now available on AT&T Broadband systems in Dallas, Denver, Salt Lake City, the San Francisco Bay Area, Seattle, St. Paul, and in selected Michigan and Rocky Mountain AT&T markets.

The service costs $79.99 per month for customers who own their modems and $82.99 for those who lease modems. The MSO's original 1.5 Mbps down, 256 kbps up offering is priced at $42.95 monthly for customers owning a modem and $45.95 for those leasing a modem.

At the same time, AT&T and Comcast are developing a trial for a lower data rate service aimed at cost-conscious dialup customers looking to upgrade to broadband. AT&T has not yet determined a price or target speed for that service.

AT&T Broadband Internet, allowing customers to access accounts from remote PCs.

Preparing for the Winter Battle

The next challenge for ISPs is to go beyond just attracting more users to the online world and to convince current users to upgrade to high-speed services. So far, early adopters have flocked to the high-speed, always-on appeal of broadband connections — despite the well chronicled lack of compelling applications. **AOL,** Microsoft, and other content providers are hustling to develop appropriate and attractive content.

Meanwhile. the grueling winter months lie immediately ahead. The fourth quarter often sees lively attention to online services as customers expand their holiday shopping through e-tailing services (increasingly loaded with rich media demonstrations). The first quarter of the new year has traditionally been the biggest growth season for online services, as families try out new services on the computer equipment they received for Christmas gifts.

This year may be different. The flattening of computer sales and the troubled economy in general will undoubtedly affect online growth. But there is an abundance of conflicting data to raise questions about online behavior. For example, a recent Nielsen/NetRatings analysis of U.S. households showed that affluent homes are prime targets for increased online usage.

According to the study, U.S. households making annual salaries of between $100,000 **and** $150,000 represent the fastest growing income group online, rising by 20 percent between September 2001 and September 2002. Richer households with incomes up to a million dollars increased by 14 percent during the past year. Nonetheless, according to Nielsen/NetRatings, the biggest online audience today is the sector with household salaries between $50,000 and $74,999. About 37.3 million people in this cohort were online users as of September 2002, the study says — indicating that half of online users (in the *TR* canvass) fall into that income category.

The shift toward broadband service is not unique in the U.S. **A** new IDC Corp. forecast shows that the European dial-up market is ready to disintegrate too, although it will grow slightly during the next two years before declining to 39.9 million connections by the end of 2006. Like the **U.S.,** the European market is increasingly dominated by a handful of ISPs. IDC found that six large ISPs serve 52 percent of dial-up customers in Europe.

Amidst these revised and competitive conditions, ISPs face fundamental business barriers of consumer price sensitivity and packaging. Speed will remain an ingredient in customers' **ISP** selection — butas broadband capability itself becomes a commodity, the next ISP battle will be fought over service features ***and*** reliability. ■

Appendix 1

CURRICULUM VITÆ

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Economic analysis of international trade issues relating to media and copyright industries.

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Jurisdiction	Case	Subject
U.S. District Court for Eastern District of Virginia, Alexandria Division	Eden Hannon & Co. v. Sumitomo Trust & Banking Co. (USA) Civil Action No. 89-0312A	Analysis of Financial Models, Cash Flow Analysis
Circuit Court for Pinella County, Florida	Home Shopping Network Inc. v. GTE. GTE FLA., Inc. and GTE Communications Corp CT. Civ. 87-014199-7	Relevance of Planning & Budgeting Reports to the Analysis of Damages
U.S. District Court for Western District of Oklahoma	Banner Industries, Inc. v. Pepsico, Inc. CIV-85-449-R	Financial Plans Financial Viability (Deposition Testimony Only)
Circuit Court for Baltimore City	Pulse One Communications Inc. v. Bell Atlantic Mobile Systems Inc. Case No. 90108057/CC112199	Damages (Deposition Testimony Only)
Supreme Court of the State of New York County of New York	Scandinavian Gourmet Provisions, d/b/a Fredricksen & Johannesen v. Jurgela, aka Al Jurgela, aka Constantine Jurgela. aka C.R. Jurgela, Valco Equities Ltd. Charles Earle, Valco Development Corp., Chase Manahattan Bank, Clinton Barrow, Franklin Investors and Harold L. Goerlich Index No. 22891/90	Damages
Chancery Court of Davidson County, Tennessee	MCI Telecommunications Corp. v. Dudley W. Taylor etc. et al. No. 88-1227-III	Tax Treatment of Telephone Access Charges
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COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
Court of Common Pleas First Judicial District of Pennsylvania	Shared Communications Service of 1800-80 JFK Boulevard Inc. V. Bell Atlantic Properties, Inc. et. al September Term 1900, No. 775	Damages, Telecommunications Industry
Superior Court of New Jersey, Law Division, Essex County	Bell Atlantic Network Services, Inc. v. P.M. Video Corp., Docket No. L-6602-91	Damages (Deposition Testimony Only)
U.S. District Court for the District of Columbia	FreBon International Corp. v. Bell Atlantic Corp. et al. Civil Action No. 94-324	Damages (Deposition Testimony Only)
U.S. District Court for the Eastern District of New York	Universal Contact Communications Inc. v. PageMart Inc.	Damages (Deposition Testimony Only)
U.S. District court for District of Maryland	Integrated Consulting Services, Inc v. LDDS	Damages (Deposition Testimony Only)
U.S. District Court Eastern District of Virginia, Alexandria Division	Mexinox, S.A. et al. v. Acerinox	Antitrust Damages (Deposition Testimony Only)
U.S. District Court Eastern District of North Carolina	Broad Band Technologies, Inc. v. General Instrument Corp.	Patent Damages (Deposition Testimony Only)
International Chamber of Commerce International Court of Arbitration	WorldSpan L.P. v. Abacus Distribution Systems Pte Ltd. And Other Case No. 9833/FMS	Damages and License Valuation
U.S. District Court for Western District of Washington at Seattle Case No. C97-10732	Arbitration between Electric Lightwave, Inc., Plaintiff v. USWest Inc., Defendant	Damages
U.S. District Court for the Western District of Oklahoma	Eateries, Inc. and Fiesta Restaurant, Inc. v. J.R. Simplot Company No. CIV-99-1330-C	Damages (Deposition Testimony Only)

COURT TESTIMONY AND APPEARANCES

Jurisdiction	Case	Subject
American Arbitration Association	Arbitration Between Avecia Inc., Claimant v. Mareva Poscines Et Filtrations, S.A. Respondent	Allocation of FIFRA Data Costs
Commonwealth of Massachusetts, Middlesex Superior Court	Netrix, Inc and Proteon, Inc. v. Digital Equipment Corp. and Cabletron Systems, Inc. CIV No. MICX 98-01533	Valuation of Software License

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Commission	Docket No.	Subject
Arizona	U-3021-96-448 et al.	Cost of Local Service
Utah	94-999-01	Investigation into collocation and expanded interconnection
Connecticut	96-02-22	Cost of Local Service
Wyoming	70000-TR-96-323	US WEST Phase II Price Regulation Plan
Pennsylvania	1-00960066	Financial Analysis
Pennsylvania	A-310203 F0002 et al.	Cost of Local Service
West Virginia	96-1516-T-PC et al.	Cost of Local Service
Minnesota	P-442, 5321 et al.	Generic Investigation of US WEST's Communications Cost
Iowa	RPU-96-9	Generic Investigation of US WEST's Communications Costs
Illinois	80-0511	Rate Base, Expenses, Forecasting
Maryland	7222	Power Plant Certificate Issues

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
District of Columbia*	777	Telephone Advertising and Parent Company Transactions
Illinois	82-0082	Gas Rate Design
Pennsylvania	M-810294	Energy Costs and Rate Design
Pennsylvania	R-822169	Nuclear Plant Economics
New Jersey	8011-827	Water and Sewerage Forecast
District of Columbia	798	Telephone Price Elasticity, Centralized Costs, Working Capital
California	83-06-65	Telephone Access Charges
Illinois	83-0142	Telephone Access Charges
U.S. International Trade Commission	731-TA-457	Handtools from People's Republic of China
U.S. Postal Rate Commission	R 83-1	Financial Viability for Electronic Mail Service
U.S. Postal Rate Commission	R 84-1	Class Revenue Requirement, Demand Projections
U.S. Postal Rate Commission	R 87-1	Pricing of Third Class Mail
U.S. Postal Rate Cornmission	R 90-1	Pricing of Third Class Mail
U.S. Postal Rate Commission	R2000-1	Pricing and Costing of Bound Printed Matter
Maryland	6807. Phase I	Utility Forecasting
New Jersey	762-194	Utility Forecasting
District of Columbia	685	Utility Forecasting
District of Columbia	827	Econometric Demand Modeling for Coin Telephone Service

* Prefiled hut not sworn. Case Settled Apri], 1982.

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
Maryland	7149	Utility Forecasting & Promotional Activities
Maryland	7300	Utility Forecasting
Maryland	7348	Utility Forecasting
Maryland	7427	Utility Forecasting
District of Columbia	737	Utility Forecasting
Maryland	7305	Telephone Advertising
Maryland	7163	Service Terminations
Maryland	7070	Utility Promotional Activities
District of Columbia	**729**	Telephone Advertising & Parent Company Transactions
Maryland	6807, Phase II	Utility Emergency Procedures
Maryland	7467	Telephone Advertising, Parent Company Transactions
Maryland	7466	Gas Utility Advertising
New Hampshire	79-18	Industrial Conservation
Maryland	**7236**	Utility Promotional Activities
District of Columbia	834	Electric Utility Load Management Evaluation
California	85-01-034	Telephone Rate Design, Cost of Service
Massachusetts	86-213	Paging Company; Financial Viability, Pricing Analysis
District of Columbia	869	Fuel Price and Electric Demand Forecasts
Louisiana	U-17949 B	Customer Owned Coin Operated Telephones
New Jersey	TO92030358	Yellow Pages/Directory Services

REGULATORY COMMISSION TESTIMONY AND APPEARANCES

Commission	Docket No.	Subject
Delaware	41	Development of **Rules** for the Implementation **of** Price Cap Regulation
Utah	94-999-01	Cost of Local Service
Connecticut	Y7-04-01	Cost **of** Local Service
New Mexico	97-35-TC	Cost of Local Service
Maine	97-505	Cost of Local Service
Vermont	5713	Cost **of** Local Service
New **York**	94-C-0095	Access Charges/Financial Analysis
New Jersey	TX95120631	Access Charges/Financial Analysis
New Hampshire	DE97-171	Cost of Local Service
Colorado	97F-175T	Access Charges/Financial Analysis
Utah	97-049-08	Access Charges/Financial Analysis
Connecticut	98-04-03	Joint and Common Costs
Rhode Island	2681	Cost of Local Service
Arkansas	99-015-U	Arbitration of Interconnection Rates
Connecticut	00-01-02	Non-recurring and Recurring Costs

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
U.S. District Court **of** Southern District of New **York**	In **Re** "Apollo" Air Passenger Computer Reservation System (CRS) MDL DKT. **No.** 760-M-21-49-MP	Liquidated Damages, Actual Damages
Supreme **Court** of the Republic of Palau	Orion Telecommunications, Ltd. v. Palau National Communications Corporations, Civil Action No. 835-88	Lost Profit Damages

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
U.S. District Court for the District of Columbia	A&S Council Oil Company, Inc. et al. v. Patricia Saiki, et al. Civil. Action No. 87-1969-OG	Damages
U.S. District Court for Eastern District of Texas	R & D Business Systems, et al v. Xerox Corp. Civil Action No. 2: 92 CV-042	Valuation of Non-Monetary Provisions of Stipulation of Settlement
U.S. District Court Eastern District of Michigan, Southern Division	Little Caesar Enterprises, Inc. v. Gary G. Smith, et al. Civil No. 93-CV-73354-DT	Class Certification (Joint Declaration with Philip Nelson)
FCC	Various	Cellular Radio Pricing: Critique of Competing Applications for Cellular in Seattle, Miami, Denver and Detroit
FCC Pricing	83-1145	Directory Data Base and Access
U.S. District Court for the District of Columbia	American Association of Cruise Passengers v. Host Marriott Corp. et al.	Damages
U.S. District Court for Eastern District of Texas	Jason R. Searcy et al. v. Philips Electronics North America Corp. et al. Consolidated Civil Action No. 1:95-CV 363, 364	Damages
U.S. District Court for Eastern District of Texas Beaumont Division	USA ex. rel. Lloyd Bortner v. Phillips Electronics	Penalties under False Claims Act
FCC	In Re Applications of Motorola, Inc.; Motorola SMR, Inc.; and Motorola Communications and Electronics, Inc. and FCI 900, Inc. For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses DA 00-2352	Wireless Dispatch Services (with Michael Baumann)
FCC (Market Disputes Resolution)	McLeodUSA Publishing Company v. Wood County Telephone Company, Inc.	Subscriber Listing Information

WRITTEN TESTIMONY ONLY

Jurisdiction	Case	Subject
FCC (Market Disputes Resolution)	Yellow Book **USA,** Inc. v. Broadwing Inc. and Cincinnati **Bell Telephone** Company	Subscriber Listing Information (Written **Report** and Deposition Testimony)
United States of America v. United Kingdom **of** Great Britain and Northern Ireland	U.S. – U.K. Arbitration Concerning Heathrow Airport **User** Changes	Participating in Negotiations Leading to Settlement of Arbitration and Related Litigation

Appendix 2

CURRICULUM VITÆ
Su Sun

Office

Economists Incorporated
1200 New Hampshire Avenue, NW, Suite 400
Washington, DC 20036
(202) 223-4700
direct dial: (202) 833-5216
fax: (202) 296-7138
sun.s@ei.com

Education

Ph.D., (expected) University of Michigan, 2003, Economics
M.A., Ohio State University, 1994, Economics
B.A., Renmin University of China, 1993, Economics

Case Experience

Senior Economist, Economists Incorporated, 2000-

Industry experience:

- Electricity
- Natural Gas Pipelines and Storage
- Oil Refinery
- Telecom
- Underwriting
- Casino
- Test Preparation
- Restaurants
- Food Flavor Enhancers
- Crop Seeds
- Steel
- Construction
- Airlines

Tasks performed:

- Conduct statistical and econometric analysis
- Evaluate and construct industry simulation models
- Evaluate survey designs
- Estimate damages using econometric models and financial models
- Evaluate and construct theoretical models of firm competition

Papers & Presentations

"Consumer Savings from Merger Enforcement: A Review of the Antitrust Agencies' Estimates", with Philip Nelson, Antitrust Law Journal, Vol. 69, Issue 3, 2002.

"When is Enough Enough? Review of Economic Literature on Merger Analysis", with Margaret E. Guerin-Calvert and Stephanie Mirrow, prepared for the American Bar Association annual meeting, August, 2001

"Consumer Surplus and the Effect of Competition Policy", Perspectives (Chinese edition), Vol. 1, No. 2, May 2001

"California Electricity Crisis and its Implications to China's Reform in the Electric Power Industry", with Minsong Liang, Perspectives (Chinese edition), Vol. 1, No. 1, March, 2001

"Introducing Competition Policy into Developing Economies: A Summary of Lessons Learned", with David Smith, Perspectives, Vol. 2, No. 4, February 2001

"Antitrust Analysis and the Enforcement in the United States", Perspectives, Vol. 2, No. 3, December 2000

"Macroeconomic Conditions at Entry and Post-entry Firm Survival: Evidence from Franchising", with Francine Lafontaine, presented to the Society of Franchising Conference, 2000

"Is Firm Growth Proportional or Disproportional? A Theoretical Reconciliation", presented at the 25th Midwest Mathematical Economics Meetings, 1999

"Does a Longer Vertical Chain Strengthen the Strategic Effect in a Market of Differentiated Products?", presented at the Summer Research Seminar, Department of Economics, University of Michigan, 1997

Research Experience

Research Assistant for Prof. Francine Lafontaine on franchising studies, 1998-1999

Research Assistant for Prof. Valerie Suslow and Prof. Lynda Oswald on firm reactions to environmental regulations in transitional economies in East Europe, 1998-1999

Research Assistant for Prof. John Laitner on Health and Retirement Study, summer 1997

Teaching Experience

Visiting Lecturer at University of Michigan Business School, 1997-1998 (Business Economics)

Graduate Student Instructor at Department of Economics, University of Michigan, 1994-1997, 1999-2000 (Microeconomics, Macroeconomics, Financial Economics)

Graduate Teaching Associate at Department of Economics, Ohio State University, 1993-1994 (Microeconomics)

Schedule 1

TABLE 2.3-TOTAL PRESUBSCRIBED LINES FOR ALL LOCAL EXCHANGE COMPANIES AS OF DECEMBER 31.1996

STATE	STUDY AREAS	BELL COMPANIES LINES	BELL COMPANIES PERCENT OF TOTAL	OTHER REPORTING LOCAL EXCHANGE COMPANIES LINES	OTHER REPORTING LOCAL EXCHANGE COMPANIES PERCENT OF TOTAL	ALL OTHER LOCAL EXCHANGE COMPANIES LINES	ALL OTHER LOCAL EXCHANGE COMPANIES PERCENT OF TOTAL	TOTAL INDUSTRY LINES	REPORTING COMPANIES PERCENT OF INDUSTRY	
ALABAMA	30	1,804,922	80.8 %	237,884	10.7 %	190,556	8.5	2,233,362	91.5 %	AL
ALASKA	25	0	0.0	0	0.0	355,185	100.0	355,185	0.0	AK
ARIZONA	15	2,256,499	93.5	7,114	0.3	150,999	6.3	2,414,612	93.7	AZ
ARKANSAS	28	887,446	68.9	97,401	7.6	303,610	23.6	1,288,457	76.4	AR
CALIFORNIA	22	15,825,276	79.9	3,674,509	18.6	305,525	1.5	19,805,310	98.5	CA
COLORADO	27	2,278,138	95.7	0	0.0	103,044	4.3	2,381,182	95.7	CO
CONNECTICUT	2	0	0.0	2,015,389	99.0	20,184	1.0	2,035,573	99.0	CT
DELAWARE	1	466,474	100.0	0	0.0	0	0.0	466,474	100.0	DE
DIST. OF COLUMBIA	1	771,630	100.0	0	0.0	0	0.0	771,630	100.0	DC
FLORIDA	13	5,663,040	59.2	3,758,046	39.3	149,416	1.6	9,571,502	98.4	FL
GEORGIA	36	3,572,631	83.6	53,104	1.2	649,673	15.2	4,275,409	84.8	GA
HAWAII	1	0	0.0	615,288	100.0	0	0.0	615,288	100.0	HI
IDAHO	21	449,625	73.4	107,810	17.6	55,320	9.0	612,755	91.0	ID
ILLINOIS	56	6,233,999	83.8	1,018,553	13.7	190,043		7,442,595	97.4	IL
INDIANA	42	1,953,053	62.6	1,030,625	33.0	138,489	4.4	3,122,167	95.6	IN
IOWA	153	989,362	66.2	261,053	17.5	244,853	16.4	1,495,268	83.6	IA
KANSAS	39	1,244,898	83.8	5,952	0.4	235,456	15.8	1,486,306	84.2	KS
KENTUCKY	19	1,113,544	58.7	356,384	18.8	427,654	22.5	1,897,582	77.5	KY
LOUISIANA	20	2,102,325	92.8	0	0.0	163,478	7.2	2,265,803	92.8	LA
MAINE	19	633,594	83.9	0	0.0	121,284	16.1	754,878	83.9	ME
MARYLAND	2	3,046,238	99.8	0	0.0	5,829	0.2	3,052,067	99.8	MD
MASSACHUSETTS	3	4,148,019	99.9	0	0.0	3,795	0.1	4,151,814	99.9	MA
MICHIGAN	38	4,843,416	84.9	668,455	11.7	191,182	3.4	5,703,053	96.6	MI
MINNESOTA	89	2,055,017	75.3	3,301	0.1	671,268	24.6	2,729,586	75.4	MN
MISSISSIPPI	19	1,166,783	93.7	0	0.0	77,964	6.3	1,244,747	93.7	MS
MISSOURI	44	2,325,764	75.9	525,965	17.2	212,453	6.9	3,064,182	93.1	MO
MONTANA	18	334,537	69.4	0	0.0	147,161	30.6	481,698	69.4	MT
NEBRASKA	42	501,392	54.0	308,678	33.3	117,853	12.7	927,923	87.3	NE
NEVADA	14	294,571	27.4	731,627	68.1	47,900	4.5	1,074,104	95.5	NV
NEW HAMPSHIRE	12	707,034	93.9	0	0.0	45,729	6.1	752,763	93.9	NH
NEW JERSEY	3	5,587,098	96.7	180,704	3.1	8,696	0.2	5,776,498	99.8	NJ
NEW MEXICO	15	693,849	85.2	39,465	4.8	80,852	9.9	814,166	90.1	NM
NEW YORK	44	10,373,195	89.7	820,486	7.1	368,698	3.2	11,562,379	96.8	NY
NORTH CAROLINA	26	2,066,889	49.6	1,522,653	36.5	577,074	13.8	4,166,616	86.2	NC
NORTH DAKOTA	24	207,695	58.6	0	0.0	146,549	41.4	354,244	58.6	ND
OHIO	42	3,733,502	60.0	1,638,053	26.3	855,185	13.7	6,227,640	86.3	OH
OKLAHOMA	39	1,510,895	82.9	100,403	5.5	211,527	11.6	1,822,825	88.4	OK
OREGON	33	1,230,646	66.6	467,317	25.3	149,351	8.1	1,847,314	91.9	OR
PENNSYLVANIA	37	5,500,537	77.3	1,241,083	17.4	378,049	5.3	7,119,669	94.7	PA
RHODE ISLAND	1	602,318	100.0	0	0.0	0	0.0	602,318	100.0	RI
SOUTH CAROLINA	27	1,309,243	66.1	148,515	7.6	504,247	25.7	1,962,005	74.3	SC
SOUTH DAKOTA	32	257,672	66.9	0	0.0	127,409	33.1	385,081	66.9	SD
TENNESSEE	25	2,465,023	80.2	278,404	9.1	378,385	12.3	3,071,812	87.7	TN
TEXAS	57	8,376,840	78.4	1,681,396	15.7	620,202	5.8	10,678,438	94.2	TX
UTAH	13	941,891	95.7	0	0.0	42,703	4.3	984,594	95.7	UT
VERMONT	10	307,533	84.1	0	0.0	57,939	15.9	365,472	84.1	VT
VIRGINIA	21	2,839,472	75.4	825,402	21.9	100,559	2.7	3,765,373	97.3	VA
WASHINGTON	22	2,298,674	69.1	718,268	22.0	293,257	9.0	3,270,199	91.0	WA
WEST VIRGINIA	10	703,559	83.1	0	0.0	142,781	16.9	846,340	83.1	WV
WISCONSIN	89	2,047,863	67.0	442,215	14.5	567,691	18.6	3,057,769	81.4	WI
WYOMING	10	226,095	82.4	0	0.0	48,214	17.6	274,309	82.4	WY
UNITED STATES	1,431	120,909,662	76.8	25,533,402	16.2	10,985,271	7.0	157,428,335	93.0	US
N. MARIANA ISL.	1	0	0.0	0	0.0	20,976	100.0	20,976	0.0	MC
PUERTO RICO	2	0	0.0	1,166,721	100.0	0	0.0	1,166,721	100.0	PR
VIRGIN ISLANDS	1	0	0.0	0	0.0	56,211	100.0	56,211	0.0	VI
GRAND TOTAL	1,435	120,909,662	76.2	26,700,123	16.8	11,062,458	7.0	158,672,243	93.0	GT

TABLE 2.4 SWITCHED ACCESS LINES BY TYPE OF TECHNOLOGY FOR REPORTING LOCAL EXCHANGE CARRIERS
AS OF DECEMBER 31, 1996

STATE	ANALOG (4KHZ OR EQUIVALENT)			DIGITAL (64KB/SEC OR EQUIVALENT)			OTHER SWITCHED ACCESS LINES	TOTAL SWITCHED ACCESS LINES	
	MAIN ACCESS LINES	PBX AND CENTREX TRUNKS	CENTREX EXTENSIONS	MAIN ACCESS LINES	PBX AND CENTREX TRUNKS	CENTREX EXTENSIONS			
			49,620			36,737	5		
ALABAMA	1 860 881	58,145	48,139	2,387	8,510	34,695	25	2,057,775	AL
ARIZONA	2 252 087	48,476	19,727	10,169	18,320	38,899	17,811	2,412,101	AZ
ARKANSAS	893 993	18,806						972.839	AR
CALIFORNIA	17 195 192	710,868	2,022,760	181,599	528	67,730	297,341	20,476,018	CA
COLORADO	2 231 922	60,209	61,298	15,732	25,691	1,895	0	2,396,747	CO
CONNECTICUT	1802,327	49,455	269,603	5,517	25,467	6,993	16,946	2,176,308	CT
DELAWARE	396,508	13,262	89,669	3,790	1,608		0	505,643	DE
DIST OF COLUMBIA	437,733	59,363	315,474	15,378	11,669	94.136	0	933,753	DC
FLORIDA	8812.102	386.291	297,841	31,979		182,561	397	9,711,171	FL
GEORGIA	3,388,002	165.793	126,340	10,359		264,568	0	3,955,062	GA
HAWAII	607.185	27.788	50,922	5,382	0	0	152	691,429	HI
IDAHO	561,598	10.013	16,953	1,200	2,811	6,263	45	598,883	ID
ILLINOS	6,253,603	290,056	785,279	47.420			53	7,376,411	IL
INDIANA	2,628.143	77,245	423,135	15485			169	3,144,177	IN
IOWA	1,196,190	30.138	24,402	2,067	2,708	45,599	2	1,301,106	IA
KANSAS	1,149,078	35,390	12,519	3,497	7,143	34,283	18,335	1,260,245	KS
KENTUCKY	1,649,605	48,742	49,018	2.721	887	45,270	621	1,796,864	KY
LOUISIANA	1,945,551	63.964	86,577	2.371		35,788	0	2,134,251	LA
MAINE	580,424	6,248	46.549	336	1,426	1.100	0	636,083	ME
MARYLAND	2,726,269	102,748	422,528	39,682	22,985	49,058	0	3,363,270	MD
MASSACHUSETTS	3,675,591	81,077	357.136	10.303	16.445	16.993	0	4,157,545	MA
MICHIGAN	4,865,712	154,182	6635531	130171			1,267	5,697,731	MI
MINNESOTA	1,834,369	75,601	167953	26165	10814		0	2,114,902	MN
MISSISSIPPI	1,063,093	30,553	20,088	503			52,116	1,168,507	MS
MISSOURI	2,689,142	86.092	58,161	8.500	18,219		0	2,980,106	MO
MONTANA	328,750	6,368	608	66	622	2.157		338,571	MT
NEBRASKA	793,576	18.333	55,355	4,068	3,875	4,867	5	880,079	NE
NEVADA	889.072	30.295	145.584	170	93	2,306	1	1,067,521	NV
NEW HAMPSHIRE	655,591	9.402	46,8801					715,643	NH
NEW JERSEY	5,209,271	121,691	378.818,	58.193	45,983			5,876,624	NJ
NEW MEXICO	785,468	17,894	6,530	773	3,402	9.946		824,071	NM
NEW NORTH CAROLINA	10,223,840	333.662	79.471	10,121		181,609	30	11,867,751	NY
NORTH DAKOTA	3,357,508	130,191		1,349	160	6.003	0	3,758,930	NC
OHIO	225.867	5,720		19,479	11,064		3,776	245,112	ND
OKLAHOMA	5 204 055	200,403	49,926	1,285	6,818	30,611	21,660	6,079,481	OH
OREGON	1471422	34,951	51,506	15,580	7,325	45,760	20	1,616,673	OK
PENNSYLVANIA	1594 752	50.905	719,412	37,424	19,896	13,528	239	1,765,848	OR
RHODE ISLAND	6 308 894	207.800	52,843	645	713	223	0	7,307,193	PA
SOUTH CAROLINA	553,124	23,614	21,158	1.586		85.207	9	631,162	RI
SOUTH UAKOTA	1 355 920	44,657	3,027	228	651	12,109	0	1,508,537	SC
TENNESSEE	242 410	6.661	44.700	12,586		93,800	0	265,092	SD
TEXAS	7 480 893	96.227	356,349	62,947	76.161	119.607	189.490	2,728,206	TN
UTAH	9,336,629	330.765	31,100	2,277	7.355	8.772	0	10.471.948	TX
VERMONT	904,306	30,531	33.660	264	828	567	0	984,341	UT
VIRGINIA	278.650	3,589	484,636	46,1121	30.348	64,286	27	317,558	VT
WASHINGTON	3,321,786	132,095	139,783	26,727	11,275	17.498	115	4,079,290	VA
WEST VIRGINIA	2,828,054	79,492	85,529	3,506	624	6,032	0	3,102,944	WA
WISCONSIN	652,856	14,828	274,526	8,522			30	763,375	WV
WYOMING	2,176,656	83,775	3,519	120	335	3,246	0	2,543,509	WI
UNITED STATES	214,393	6,556	11,198,337	949,491	519,148	1,890,745	627,875	228,169	WY
PUERTO RICO	134,090,043	4,710,916	2,031	164	2,695	0	0	153,986,555	US
TOTAL	1,032,795	140,330	11,200,368	949,655	521,843	1,890,745	627,875	1,178,015	PR
	135,122,838	4,851,246						155,164,570	TO

TABLE 2.3-TOTAL USF LOOPS FOR ALL LOCAL EXCHANGE COMPANIES
AS OF DECEMBER 31, 1998

STATE	STUDY AREAS	BELL COMPANIES LOOPS	BELL COMPANIES PERCENT OF TOTAL	OTHER REPORTING LOCAL EXCHANGE COMPANIES LOOPS	OTHER REPORTING LOCAL EXCHANGE COMPANIES PERCENT OF TOTAL	ALL OTHER LOCAL EXCHANGE COMPANIES LOOPS	ALL OTHER LOCAL EXCHANGE COMPANIES PERCENT OF TOTAL	TOTAL INDUSTRY LOOPS	REPORTING WMPWIES PERCENT OF INDUSTRY	
ALABAMA	30	1,985,770	79.8	281,070	11.4 %	217,883	8.8 %	2,464,723	91.2 %	AL
ALASKA	25	0	0.0	0	0.0	408,528	100.0	408,528	0.0	AK
ARIZONA	16	2,687,683	93 6	8,170	0.3	175,104	6.1	2,870,957	93.9	AZ
ARKANSAS	28	979814	68.9	65,721	6.0	356 639	25.1	1,422,174	74.9	AR
CALIFORNIA	22	17427132	784	4,455,225	200	339 509	1.5	22 221 866	98.5	CA
COLORADO	28	2637428	957	0	00	119,403	4.3	2,756,829	95.7	CO
CONNECTICUT	2	2,188,763	99.0	0	0.0	22,883	1.0	2211048	99.0	CT
DELAWARE	1	558 152	100.0	0	00	0	0.0	558,152	100.0	DE
DIST OF COLUMBIA	1	934,397	100.0	0	00	0	00	934 397	100.0	DC
FLORIDA	12	8 507,857	59.4	4 272,490	390	178,117	1.6	10,958,464	98.4	FL
GEORGIA	36	4 181,693	83.5	306,393	6 1	516,985	10 3	5,005,071	89.7	GA
HAWAII	2	0	0.0	117.132	100.0	108	00	717.840	100.0	HI
IDAHO	21	508,685	72.0	131,108	185	87.071	95	706,842	90.5	ID
ILLINOIS	56	7013,269	85.4	916,494	11.2	279 522	3.4	8,209.285	96.6	IL
INDIANA	42	2,239,222	82.4	1,194,686	33.3	155273	4.3	3.589.181	95.7	IN
IOWA	154	1,066,349	65.0	283,911	17.3	291 151	17.7	1,641,411	82.3	IA
KANSAS	39	1,385,402	84.0	6,401	0.4	257 891	15.6		84.4	KS
KENTUCKY	19	1,208,974	56.7	048.857	30 3	278160	13.0	2,133,791	87.0	KY
LOUISIANA	20	2,347,702	92.8	0	00	181 732	7.2	2,529,434	92.8	LA
MAINE	20	688,700	83.5	0	00	135 957	16.5		83.5	ME
MARYLAND	2	3,629,056	99.8	0	00	6,968	0.2	3,636,024	99.8	MD
MASSACHUSETTS	3	4 510.477	999	0	0 n	4,020	0.1	4,514,497	99.9	MA
MICHIGAN	39	5.433.171	047	755,008	118	225 670	35	6.413049	96.5	MI
MINNESOTA	88	2205811	73.7	0	n 0	787168	26 3	2992,979	73.7	MN
MISSISSIPPI	19	1,280,382	935	0	00	89167	85	1,369.549	93.5	MS
MISSOURI	44	2,590,300	75.1	680,238	19.7	160026	5.2	3,450,562	94.8	MO
MONTANA	18	358,852	68 5	0	0.0	164,639	31.5		68.5	MT
NEBRASKA	41	526.026	51 8	349,530	34.4	139.119	13.7	1,014,675	86.3	NE
NEVAOA	14	348,674	21 3	872,994	68.3	55852	4.4	1,277,520	95.6	NV
NEW HAMPSHIRE	12	789,655	938	0	0.0	54,099	6.4	843,954	93.6	NH
NEW JERSEY	3	6,252.611	€56	212,925	3.3	9,878	0.2	6,475,414	99.8	NJ
NEW MEXICO	15	786,574	85.0	46,388	5.0	92 Cd5	100	925,007	90.0	NM
NEW YORK	44	11 553.051	90.0	886,879	6.9	403 858	3.1	12,843,788	96.9	NY
NORTH CAROLINA	26	2 459 133	49.8	2,013,685	40.7	469 404	9 5	4,942,302	90.5	NC
NORTHDAKOTA	24	250 274	61.0	0	0.0	159703	390	409.977	61.0	ND
OHIO	42	4,092,482	59.4	2,466,090	35.8	328 746	4.7	6,885,318	95.3	OH
OKLAHOMA	39	1,664 971	82.5	118 118	5.9	235,077	11.6	2,018.166	88.4	OK
OREGON	33	1,366,840	858	544,435	26.2	167526	81	2,078,801	91.9	OR
PENNSYLVANIA	36	6,346,577	773	1,500,576	18.3	364,899	44	8212052	95.6	PA
RHODE ISLAND	1	661,033	100.0	0	0.0	0	0.0	861,033	100.0	RI
SOUTH CAROLINA	27	1,467,777	65.3	187,219	8.3	593,208	26.4	2,248,204	73.6	SC
SOUTH DAKOTA	31	273,563	654	0	0.0	144.469	34.6	416032	654	SD
TENNESSEE	25	2,684,626	79 7	256,109	7.6	428,094	12.7	3,368,829	87.3	TN
TEXAS	57	9,802.614	777	2,277,946	18.1	536 028	4.2	12,616,588	95.8	TX
UTAH	13	1,081,672	950	0	0.0	56, 417	5.0	1,138,089	95.0	UT
VERMONT	10	339,570	84.5	0	0.0	62,301	15.5	401,871	84.5	VT
VIRGINIA	21	3.474,493	75.9	987.813	21.6	112,636	2.5	4.574,942	97.5	VA
WASHINGTON	23	2,489,593	68 0	919,500	25.1	253,492	6.9	3,662,585	93.1	WA
WEST VIRGINIA	10	824,403	83 6	0	0.0	162 135	16.4	986,538	83.6	WV
WISCONSIN	88	2,175880	64.1	499,812	14.7	716, 333	21 1	3,392,025	78.9	WI
WYOMING	10	240,854	83.1	0	0.0	49,009	16.9	289,863	83.1	WY
UNITED STATES	1,432	138,488,145	77.6	28,881,319	16.2 %	11,032,002	6.2 %	178,401,466	93.8 %	US
GUAM	1	0	00	0	0.0	75,051	100.0	75,051	0.0	GU
N MARIANA ISL.	1	0	0.0	0	0.0	20,639		20,639	0.0	MC
PUERTO RICO	2	0	0n	1,261.733	100.0	0	0.0	1,261.733	100.0	PR
VIRGIN ISLANDS	1	0	00	0	0.0	63,234	100.0	63,234	0.0	VI
GRAND TOTAL	1,437	138,488,145	770	30,143,052	16.8 %	11,190,926	6.2 %	179,822,123	93.8 %	TO

** SEE NOTES FOLLOWING TABLE 2 8

TABLE 2.4-SWITCHED ACCESS LINES BY N P E OF TECHNOLOGY FOR REPORTING LOCAL EXCHANGE CARRIERS AS OFOECEMBER 31, 1998

STATE	ANALOG (4KHZ OR EQUIVALENT)			DIGITAL (MKBPS OR EQUIVALENT)			OTHER SWITCHED ACCESS LINES	TOTAL SWITCHED ACCESS LINES	
	MAIN ACCESS LINES	PBX AND CENTREX TRUNKS	CENTREX EXTENSIONS	MAIN ACCESS LINES	PBX AND CENTREX TRUNKS	CENTREX EXTENSIONS			
ALABAMA	1,982,592	69,980	57.042	6.427		78,509		2,195,439	
ARIZONA	2,376,319	41,452	203,877	39,004	76,951	21,012	4	2,758,619	AZ
ARKANSAS	954,680	17,284	21.533	3,590	9,986	17,346	34.169'	1,058,588	AR
CALIFORNIA	18,055.495	740,781	2,329,060	378,846	342.382	0	638,569	22,485,133	CA
COLORADO	2,311,527	51,133	161,056	49,720	86,977	18,055	0	2,678,468	CO
CONNECTICUT	1,705.934	34,660	483,598	19.271	53,676	29,786	39,081	2,565.006	DE
DELAWARE	430,390	13,254	98,821	18,229	2,760	2,252,	0		
DIST. OF COLUMBIA	445,979	61,273	313,462	39,599	8.976,	121,310	0	990,599	DC
FLORIDA	9,824,006	326,300	368,560	82,383	5,645	152.557	21,596	10,781,047	FL
GEORGIA	3,754,618	190,747	193,133	23,005		224,946	0	4,386,449	GA
HAWAII	620,196	28,253	60,436	12,152	0	0	3.814	724,851	HI
IDAHO	601,819	9,748	31,574	6,110	13.324	2.226	897	665,698	ID
ILLINOIS	6,517,599	299.1521	872,177	85,234			7,131	7.781,293	IL
INDIANA	2,788,902	85.428	480.301	35,398	430		9.881	3 400 340	IN
IOWA	1,164,346	28,464	104.230	14 240	24 136	98,013	578	1,375,007	IA
KANSAS	1,229,753	34,465	13,311	9,543	12.056	38,741		1,372,899	KS
KENTUCKY	1,770,778	57,446	70.352	9,814	3,815	32,245	35,030	1,947,289	KY
LOUISIANA	2,094,144	77,846	106,643	6,067		30.546	0	2,315,246	LA
MAINE	611,728	8.109	5,649	1,514	10,392	44,327	1.837	683,556	ME
MARYLAND	2,892,994	102,407	503,587	14,945	21,024	93,406	0	3,728,363	MD
MASSACHUSETTS	3,846,540	111,119	68,775	37,457	107,432	294,269	19.448	4,485,040	MA
MICHIGAN	5,150,304	175.7281	701,507	34,279			3,354	6,065,172	MI
MINNESOTA	1,840,660	64,564	208.070	64,229	83,261	30,776	0	2,291,560	MN
MISSISSIPPI	1,147.840	41.143	28,353	1.789		47.243	0	1,266,368	MS
MISSOURI	2,868,986	86,533	64.080,	25,123	29,458	68.001	84,388	3,226,569	MO
MONTANA	342,034	5,974	6,277	2.808	8,807	1,390	0	367,290	MT
NEBRASKA	812,562	15,878'	73.128	10,381	15.948	5,447	389	933,733	NE
NEVADA	996.724	48,514	163,179	3,894	3814	3.783	433	1,220,341	NV
NEW HAMPSHIRE	702,051	13.030	3.717'	3,480	10,092	46.852	2,184	781.406	NH
NEW JERSEY	5,624,607	121,743	490,482	271,878	59,748	85,198	0	6,653,656	NJ
NEW-MEXICO	814,120	14,518	32,888	4,304	21,406	3,140	346	890,722	NM
NEWYORK	10,564.451	318293)	143,742,	121.639	154,883	941,875	53,029	12,317,912	NY
NORTH CAROLINA	3,905,513	218,010	57,027	26.023	1,600	167,810	3.938	4,380,721	NC
NORTH DAKOTA	216,534	5,072	18,190	3575	5.267	7,201	0	255,839	ND
OHIO	5,517,950	212,019	691,592	38,883	36,456		5,188	6,502,088	OH
OKLAHOMA	1,565,549	31,921	61,995	8.811	11,014	33,193	40,520	1,753,063	OK
ORFGON	1,687,272	48,078	105,473	37,997	30 422	30,145	3,863	1,943,250	OR
PENNSYLVANIA	6,579,453	211,323	913,585	150,325	300491	24,150	4,588	7,913,473	PA
RHODE ISLAND	569,333	12,054	9,987	2,323	7,539)	55.265	2,080	658,581	RI
SOUTH LAROLINA	1,483,826	56,291	29,126	1,939	5,568	77.300	4,662	1,657.636	SC
SOUTH DAKOTA	235,713	6,258	20.093	3,283	1,055	9,380	0	278,951	SD
TENNESSEE	2.656,149	107,344	44,692	23.283,	2,905	66,799	0	2,899,322	TN
TEXAS	10,406,549,	322,5421	397,639	180.904	92.905	152,567	246.477	11,799,583	TX
UTAH	958,986	28,749	56,383	190571	27.490	14 814	0	1,105,4791	UT
VERMONT	284,426	4,369	8.065	1,356	5,097	32,522	775	336,610	VT
VIRGINIA	3,573,487	158,480	571,945	154,176	30,581	96,504	6,611	4,591,784	VA
WASHINGTON	3,023,286	72,511	224.336	76,889	48.471	31,230	12,468	3.489 191	WA
WEST VIRGINIA	681,488	15,408'	104,500	16,972	672	7.782	0	826,822	WV
WISCONSIN	7,207,9741	94,692'	305,912	18,334			4,123	2,631,035	WI
WYOMING	217,329	6,008	11,895	1,5211	4.906	3,161	0	244.820	WY
UNITED STATES	142,635,495	4,906,348	12,095,835	2,305,151	1,506,531	3,284,074	1,295,179	168,028.613	US
PUERTO RICO	1,092,796	144,966	1,951	3.611	10,106	0	0	1,253,430	PR
TOTAL	143,728,291	5,051,314	12,097,786	2,308,762	1,516,637	3,284,074	1,295,179	169,282,043	TO

State	Analog (4Khz or Equivalent)			Digital (64Kbps or Equivalent)			Other Switched Access Lines	Total Switched Access Lines	
	Main Access Lines	PBX and Centrex Trunks	Centrex Extensions	Main Access Lines	PBX and Centrex Trunks	Centrex Extensions			
Alabama	2,019,151	75,743	55,468	12,431	0	59,895	2,405	2,225,093	AL
Arizona	2,465,770	33,750	234,523	126,794	90,949	16,336	1	2,968,123	AZ
Arkansas	903,078	13,847	27,512	5,880	23,526	25,065	49,679	1,048,587	AR
California	18,816,771	703,767	2,393,022	422,522	486,750	0	779,886	23,602,718	CA
Colorado	2,326,322	40,524	207,862	139,741	100,573	30,867	0	2,845,889	CO
Connecticut	1,648,181	53,432	670,806	19,602	50,705	23,426	41,655	2,507,807	CT
Delaware	448,428	11,399	99,010	1,396	32,125	3,350	0	595,708	DE
District of Columbia	440,699	51,347	304,106	10,206	60,450	152,218	0	1,019,026	DC
Florida	10,220,676	363,005	299,882	114,094	14,155	205,441	41,115	11,258,368	FL
Georgia	3,814,191	189,292	100,553	28,786	0	311,271	0	4,444,093	GA
Hawaii	625,179	22,050	63,961	20,788	0	0	11,392	743,370	HI
Idaho	622,353	8,912	44,673	26,014	18,633	2,202	2,862	725,649	ID
Illinois	6,549,179	276,467	802,114	106,187	0	0	13,998	7,747,945	IL
Indiana	2,904,414	79,066	468,414	53,037	5,526	0	32,723	3,543,180	IN
Iowa	866,787	19,774	125,526	48,686	39,216	44,014	0	1,144,003	IA
Kansas	1,215,535	27,595	21,859	12,361	20,258	41,127	57,329	1,396,064	KS
Kentucky	1,828,543	56,406	56,601	19,910	6,273	45,703	13,974	2,027,410	KY
Louisiana	2,138,326	81,360	91,238	7,880	0	42,753	0	2,361,557	LA
Maine	640,353	7,704	3,490	2,984	44,221	51,101	0	749,853	ME
Maryland	3,046,564	89,659	574,215	33,522	176,179	131,620	0	4,051,759	MD
Massachusetts	3,800,441	106,187	45,846	70,814	232,278	381,056	0	4,636,622	MA
Michigan	5,308,661	197,841	639,592	51,041	0	0	7,549	6,204,684	MI
Minnesota	1,775,967	50,146	233,565	150,976	95,823	36,192	0	2,342,669	MN
Mississippi	1,197,251	46,770	17,052	2,731	0	55,005	0	1,318,809	MS
Missouri	2,822,881	77,954	76,032	36,902	45,155	64,823	113,506	3,237,253	MO
Montana	343,372	5,223	11,324	13,032	12,639	1,034	0	386,624	MT
Nebraska	666,139	11,688	81,940	24,340	17,933	3,124	0	805,164	NE
Nevada	1,081,479	61,594	160,565	6,397	19,556	4,157	3,216	1,336,964	NV
New Hampshire	713,105	12,706	2,497	6,143	33,549	48,322	0	816,322	NH
New Jersey	5,916,514	103,942	562,082	88,173	393,590	88,292	0	7,152,593	NJ
New Mexico	748,473	10,043	45,070	25,637	31,459	2,715	0	863,377	NM
New York	10,848,067	267,362	93,758	145,435	455,405	1,136,693	5,303	12,952,023	NY
North Carolina	4,148,306	227,128	51,187	33,876	7,905	169,399	8,696	4,646,497	NC
North Dakota	163,274	3,693	18,825	13,448	7,614	11,797	0	218,651	ND
Ohio	5,742,201	198,631	598,264	50,359	57,793	0	19,589	6,666,837	OH
Oklahoma	1,456,901	22,409	70,095	11,259	21,695	30,861	47,595	1,660,815	OK
Oregon	1,714,264	45,419	110,651	101,600	40,776	25,144	11,496	2,049,350	OR
Pennsylvania	6,554,800	195,095	929,983	22,167	271,437	39,786	15,121	8,028,389	PA
Rhode Island	566,060	10,746	8,674	3,957	21,874	59,153	0	670,464	RI
South Carolina	1,539,419	59,862	17,342	7,104	0	76,921	9,511	1,710,159	SC
South Dakota	213,184	4,995	31,040	10,639	8,367	12,574	0	280,799	SD
Tennessee	2,688,144	104,777	36,984	28,072	2,415	67,562	0	2,927,954	TN
Texas	9,693,843	256,496	435,114	250,808	96,763	150,280	267,666	11,150,970	TX
Utah	961,465	22,189	67,251	66,529	32,708	14,957	0	1,165,099	UT
Vermont	296,134	3,971	8,086	2,372	14,223	43,606	0	368,392	VT
Virginia	3,718,986	150,476	596,901	51,996	237,457	111,762	19,996	4,887,574	VA
Washington	3,009,074	66,989	257,686	192,104	60,222	28,311	29,362	3,643,748	WA
West Virginia	717,912	15,025	98,101	3,986	51,616	11,328	0	897,968	WV
Wisconsin	2,128,521	91,353	312,541	27,447	0	0	7,980	2,567,842	WI
Wyoming	204,287	4,971	24,423	7,988	9,242	10,355	*0*	261,266	WY
United States	144,279,625	4,640,780	12,287,306	2,720,153	3,449,013	3,871,598	1,613,605	173,862,080	US
Puerto Rico	1,145,266	**143,111**	1,213	9,678	17,440	0	*0*	1,316,731	PR
Ocean Cable	0	0	0	0	0	*0*	*0*	*0*	OC
Total	145,424,891	4,783,914	12,288,519	2,729,831	3,466,453	3,871,598	1,613,605	174,178,811	TO